

EDITORIAL

Taxes Again

THE automotive industry is organizing again for a fight to have removed the now pointless war taxes with which its products still are burdened. Progress was made in the last Congress when the taxes were removed from certain types of trucks and the levy of parts was cut in half. But the big job still lies ahead.

With business men, Government officials and civilians the country over pointing to the automobile as an essential utility of our present social and economic system, it would seem as though there could be no logical reason why this unit should have to carry its present tax burden any further. But logic is not the guiding star of legislative enactment. Consequently the industry will have to marshal its lines of reason again and present them with all the vigor and clarity possible before the Congress which will assemble in December.

Active work along this line is being done at the present time. Men in every phase of the industry can do their part by urging actively upon their Representatives the justice of the automotive request for tax reduction. Besides performing a service to the industry by so doing, a good many men will add to the store of their own political knowledge by learning for the first time the name of the man who represents them at the Capitol.

Tools Make Profits

WE can't do an efficient production job because our machinery isn't up to date. We can't get new machinery because the company is in the hands of bankers and they can't see the economy of spending money now for the benefit of greater ultimate profits. Their idea of economy is just not to spend money."

How many times has that cry been set up by manufacturing men in the automotive as well as in other industries? A good many times, certainly.

It's foolish to accuse bankers as a class just as it isn't fair to judge individuals in any group by the actions of a majority of their fellows. Just the same, there is considerable evidence to indicate that the banker often has failed as a business builder when a manufacturing enterprise has come into his hands. From a prominent banker, as a matter of fact, comes the most recent statement to that effect that we have seen.

Writing on the constructive value and possibilities of the machine tool industry in *Trade Winds*, J. R. Kraus, vice-president, Union Trust Co., of Cleveland, says that "Failure to sense the essential nature of machine tools is particularly evident upon the part of men engaged in the marketing and financial end of any manufacturing business. Bearing in mind the lesson taught by the inflation and depression following

the war, these men are loathe to spend money—an attitude which is creditable enough in itself, but which sometimes defeats its own purpose.

"In fact, looking at it from a positive rather than a negative point of view, the purchase of new machinery may decidedly add to the net profits of a plant, and this increase in net profits may be figured quite definitely in advance."

Financing Trends

THE trend toward closer control of retail sales financing by car manufacturers continues steadily. While working agreements between car builders and finance companies have been in existence in one form or another for several years back, the direct tie-up made by the Chrysler insurance plan marked a major stride toward greater influence on retail sales financing of the vehicle makers.

Now the Dodge arrangement with Commercial Investment Trust Co., records another step in the same direction. When the Chrysler plan has been fought through the courts, other manufacturers undoubtedly will take advantage of the Chrysler experience to work out further ideas along the same line.

Even finance company executives whose organizations are not involved in any direct deal with a car manufacturer now admit that more such combinations are likely from now on. Despite this trend, however, it should be remembered that millions of dollars worth of instalment automobile paper will be handled every year by finance companies and agencies having direct contractual relationship with any car different forms of handling the operations, specially adapted to particular local conditions, will continue to be an important factor in the situation.

British Progress in Design

ADVANCE information received from London in connection with the show of passenger cars at Olympia makes it evident that British manufacturers have done a lot of engineering work during the past year and will introduce at the show new chassis in considerable numbers. Most of the older British makers brought out new models shortly after the war and have continued to make these until now. The state of prosperity which the industry enjoyed during recent years did not particularly encourage changes in design, but this year many firms seem to have come to realize that the advancement of the art in general made it necessary to revise their lines.

Particularly noteworthy is the appearance of a considerable number of new sixes. The six has long been regarded abroad as a luxury type, but it is now being realized that for equal piston displacement it need cost but very little more in manufacture and in upkeep, and its advantages over the four are even greater in a low-powered than in a high-powered car.

Our Industry Today

Sales Are Booming in All Parts of Country—Additions to Plants Forecast Keen Competition—Used Car Stocks Increase

NEW YORK, Oct. 7—Few signs of recession appear on the automotive horizon. Most of the large factories are holding production steadily to unusually high levels for this time of year, and at least one large factory has been gradually speeding up for the last two or three weeks. Stimulated by price reductions and easy time payment terms, sales are booming in virtually all parts of the country.

Exports of cars and trucks, after a slight early summer recession, are again climbing, the figures for August showing again of about 100 per cent in unit numbers over the July totals. Lower prices have undoubtedly contributed to this gain, helping to boost the American vehicles over the foreign tariff walls. Several of the automobile and truck companies have expansion programs for overseas trade under way, and the industry as a whole is considering measures for better financing of sales abroad and for the reduction of distribution and delivery costs.

Keen Competition Ahead

Several factories have announced plans for additions to their plant capacity, and this forecasts a period of unprecedentedly keen competition beginning later in the season. The year 1926 will be one of the hardest that sales departments have ever faced, because on them will fall the burden of keeping distribution up to the increased capacity of the plants.

A repercussion of the recent price cuts is being felt in the used car markets. Stock of the traded-in and resold vehicles have been increasing in many of the important sections of the country, which to an extent is a normal seasonal trend; but the tendency is enhanced by the extremely attractive prices and terms on which the new cars can now be acquired. Dealers are frequently having to take losses to move their used car stocks, but on the whole they are meeting the situation in the best possible way—by reducing their allowances on trade-ins.

The public is showing an increasing disposition to demand only the best in used cars, insisting on models of good appearance and with essential parts rebuilt or placed in the best running condition.

WHITE CO. ON THE COAST

LOS ANGELES, Oct. 8—The White Company has decided to establish a direct factory branch in Los Angeles in a new and large plant to be built for its own use.

dened with the weight of too many laws and too many requests for additional legislation, which, if passed, would add to the ills of business, rather than correct them.

Constructive Foreign Policy Needed

Necessity for automotive exporters to handle foreign sales as an integral part of their marketing operations and not to regard foreign markets merely as a place to dump surplus production was the chief point emphasized throughout the foreign trade session, which was held Wednesday evening. M. L. Heminway, general manager of the M. A. M. A., in his talk on "Automotive Business Prospects Abroad," pointed out the evils which have resulted from this policy in the past, while C. R. Osborn, general manager, Overseas Motor Service Corp., showed how a permanent constructive policy in this regard can be worked out successfully. Walter C. Rink, sales manager, Stevens & Co., showed the importance of studying men and giving attention to the human side of export selling. Mr. Heminway reiterated his statement, made immediately upon his return from Europe several weeks ago, that overseas sales of parts and accessories, while likely to grow as time goes on, will be made only by serious and continued effort on the part of American manufacturers, since foreign competition is very keen, and the needs of foreign buyers harder for our makers to meet than are the needs of purchasers in the United States.

M.A.M.A. Meets in Annual Convention

Foreign and Domestic Business Among Topics Discussed. Foreign Competitors

MONTREAL, Oct. 8—Talks on foreign and domestic business and the part the automotive equipment and accessory manufacturer is playing in it held the attention of the large gathering of members of the Motor and Accessory Manufacturers' Association here for their annual convention.

Announcing "Good Management" as the theme of the convention, E. P. Chalfant, vice-president Gill Mfg. Co., and president of the M. A. M. A., said that only through the better conduct of their business could the manufacturers raise their profits to a satisfactory level. A better outlook for world business than at any time since the war was seen by Francis H. Sisson, vice-president of the Guaranty Trust Co. What was needed to make this promise bear fruit, he said, was the realization by American business men of how closely their interests were interlocked with the commerce and industry of foreign countries. If Europe was to pay the war debts and stabilize currencies, the United States would have to give up some gold and increase imports or decrease exports, either of which would cause temporary embarrassment and require adjustments of the commercial structure of the country.

Co-operation a Necessary Factor

William T. Morris, vice-president of the American Chain Co., and president of the Automotive Equipment Association, speaking on "Putting Good Management to Work in the Automotive Equipment Industry," stressed the need for co-operation in the elimination of waste and inefficiency.

Merle Thorpe, editor of *The Nation's Business*, urged industrial managers to work out their own problems rather than look to the Government for aid. Washington, he said, was already overbur-

Advance in Tire Prices Foreseen

AKRON, Oct. 7—Continued firmness of the crude rubber market around the 90 cent a pound level will soon bring about another general advance in automobile tire prices, according to the opinion expressed by leading rubber manufacturers here.

President Thomas F. Walsh, of the Swinehart Tire & Rubber Co., announced an increase of 10 per cent on all lines of tires, effective immediately.

"An advance of 25 per cent is justified under present conditions," said Mr. Walsh. "Most of the tire companies which have been producing on cheap crude rubber are reaching the point where they must pay higher prices. It is impossible to sell tires at our September list, keep up with the quality and yet make money."

Swinehart tires have sold on the same basis as others until this increase, which is a direct step toward generally higher prices.

The large companies have not yet revised their price lists on tires, but it is understood they have been considering it.

Fall Meeting of the N.A.C.C. Held

Drawings for 1926 Automobile Show Made—Unauthorized Parts Discussed

NEW YORK, Oct. 8.—With export of American cars now representing 8 per cent of American production, and equal to retail sales of twenty-one States, more than 100 car and truck manufacturer members of the N. A. C. C. discussed plans for further increase in foreign business at the annual fall meeting of the Association here today.

John N. Willys, chairman of the Foreign Trade Committee, conducted the discussion on export, and said that a 2,000,000 mark in annual export trade was not many years in the future.

In the morning session, with Charles Clifton, president of the N. A. C. C., presiding, plans were discussed for world wide increase in motor vehicle trade, and complete removal of all Federal war excise taxes on motor transport were favored unanimously.

Afternoon Session

In the afternoon, the truck manufacturers and Traffic Planning and Safety Committee held meetings, while the drawings for the New York and Chicago National shows were being made.

Improved financing plans whereby the foreign dealer can get his cars at much lower cost than is possible now, and with greater convenience, was advocated by C. W. Nash. That the work of the Federal Reserve Board is helping American trade abroad, particularly through export banking advice, was pointed out by Alfred H. Swayne.

Invitations to foreign manufacturers to come to this country and go through the American plants were extended on behalf of the directors by Roy D. Chapin, who said that the time had come when trade must be regarded on a world-wide basis, with mutual co-operation.

Shipping Pointers

M. C. Reichert reported that, in many cases, it is profitable to ship automobiles without boxing and M. L. Pulcher advocated that boxes be built so that the lumber will be useful to the dealer who receives it.

H. H. Hills pointed out that there is now 33 per cent excess freight charge in using boxes for shipment. Percy Owen told of progress being made in commercial relations abroad, and Henry Chalmers, of the Department of Commerce, said that more friendly trade agreements are being worked out with foreign countries. C. J. C. Quinn, of the International Chamber of Commerce, outlined the need for more complete trade arrangement.

E. C. Morse favored personal attention of chief executives of each company to the foreign trade problem. J. H. Dreibellis pointed out that all dealers abroad, no matter what product, domestic or foreign,

they represent, can organize together for a condition which will encourage motor transport.

A drawing for the 1926 Automobile Show which is to be held January 9-16, featured the fall meeting of the N. A. C. C. held at headquarters here today. The alphabetical list of drawings follows: Ajax, Auburn, Buick, Cadillac, Case, Chrysler, Chandler, Chevrolet, Cleveland, Davis, Dodge, Dupont, Elcar, Essex, Flint, Franklin, Gardner, Gray, Hudson, Hupmobile, Jewett, Jordan, Kissel, Lexington, Lincoln, Locomobile, Locomobile, Jr. Eight, McFarlan, Marmon, Moon, Nash, Oakland, Oldsmobile, Overland, Packard, Paige, Peerless, Pierce-Arrow, Pontiac, Reo, Rickenbacker, Roamer, Star, Stearns, Studebaker, Stutz, Velie, Wills Sainte Claire, and Willys-Knight.

In addition to these, non-member manufacturers, spaces were also drawn by Bauer and Luxor and member drawings for taxi exhibitors covered Dodge, H. C. S., Oakland, Reo, Willys-Overland, and Yellow Cab. The list included fifty-seven exhibitors, of whom forty-nine are manufacturers who are members of the N. A. C. C., two non-members and six manufacturers of taxis.

Unauthorized Parts Discussed

With A. G. Sandt, of General Motors Corp. presiding today, committee on replacements parts, of which B. G. Koether is chairman, discussed the whole question of unauthorized parts as they affect the marketing of original parts made by car manufacturers. This committee recently sent out a questionnaire asking car manufacturers to what extent they manufacture and market replacement parts, and how this business is affected both by jobbers representing manufacturers of standard parts and by independent manufacturers of parts and their distributors. In general, the answers gave little information not known to the committee already. No further recommendations will be made, at least until the questionnaire has been expanded to include standard parts makers and their distributors. When the questionnaire is complete, it is possible that recommendations will be made in addition to those comprised in the committee's report in 1922. The chief recommendations in this report are that car manufacturers market their parts as well as their legitimate competitors with due regard to competitors' prices, guarantee and availability of supply; that their supply of replacement parts be marked to distinguish them as produced by the makers of the original parts, and that car manufacturers educate the dealer and the public in the importance and value of using replacement parts made by the manufacturers of original parts.

LOUISVILLE CAR SHOW

LOUISVILLE, KY., Oct. 8.—February 15-20 has been announced as the date of the Louisville Automobile Show. The eighteenth annual exhibition will be held under the auspices of the Louisville Automobile Dealers' Association.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Oct. 7.—Further expansion in business activity was noted last week. Cooler weather stimulated retail trade, while the favorable effects of good crop yields were widely felt in the West and South. Preparations for heavy dividend and interest payments caused another advance in the call money rate to 6 per cent. General commodity prices declined rather sharply, while stock quotations continued firm, with great activity in the speculative shares.

Car loadings continued to surpass the corresponding totals of former years in the week ended September 19, numbering 1,098,428, as against 975,434 in the preceding week and 1,076,553 a year earlier. Reports so far available for August indicate that the railroads will show a substantial gain in net earnings as compared with a year ago.

Sales of leading mail order houses last month were 11 per cent larger than in September, 1924. Sales in the first nine months of the year were 13 per cent larger than in the corresponding period last year.

Commercial failures reported to R. G. Dun & Co. last month numbered 1,465, marking the fifth consecutive monthly decline, and the smallest total in a year. Last month's figure compares with 1,513 in August, and 1,306 in September, 1924.

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended September 30 were 3 per cent greater than the total for the preceding week and 13 per cent above that for the corresponding period last year.

Fisher's Index of wholesale commodity prices stood at 157.0 last week, comparing with 158.3 in the preceding week and 158.4 four weeks earlier. The present level is the lowest reached since last June.

Earning assets of the Federal Reserve banks increased \$44,200,000 during the week ended September 30, with a decline of \$7,500,000 in discounts more than offset by gains of \$29,800,000 in open market purchases and \$19,800,000 in Government securities. Note circulation increased \$14,800,000 and deposits \$500,000, while reserves decreased \$5,400,000. The reserve ratio declined from 72.9 to 72.5 per cent.

Time loan and commercial paper rates remained unchanged last week at 4½ to 4¾ per cent and 4½ to 4¾ per cent, respectively.

Moves Into New Building

LITTLETON, COL., Oct. 6.—The Coleman Motors Corp. has just moved into its new factory building here.

New Yellow Taxicab Shows Many Changes

Driver's Enclosed Compartment, Roomier Passenger Accommodation Among Improvements

CHICAGO, Oct. 7—A new Yellow taxicab resembling a conventional sedan in appearance, mounted on a 114-in. wheelbase chassis, has been brought out by the Yellow Cab Mfg. Co.

Major changes incorporated in the new cab, which is designated as type O-5 and as the "Mile Merchant," are the fully enclosed drivers' compartment and a larger and roomier passenger compartment seating six persons. Despite the longer wheelbase, the turning radius is the same as for the 109-in. model. Rubber shock insulators are used and other features include balloon tires, air cleaner and throttle-controlled oil pressure.

The engine is a sleeve valve type with a 3 7/16-in. bore and a 5-in. stroke. Pistons are of cast iron and are 4 in. high with three 3/16-in. rings. Three bronze-backed bearings support the crankshaft, the diameters and lengths of these bearings from front to rear being, respectively, 2 5/32 x 2 7/16-in., 2 7/32 x 2 7/16-in. and 2 9/32 x 3 5/16-in. Force feed lubrication is provided by a gear oil pump driven off the eccentric shaft. Cooling water is circulated by thermo-syphon and the fuel feed is by gravity from a 14-in. gal. tank mounted in the cowl. Electrical equipment includes Bosch magneto and a North East six-volt generator with voltage regulator. Starting motor and battery ignition are furnished at extra cost.

Additional Features

Other units entering into the assembly are a multiple disk clutch, three-speed transmission, Spicer propeller shaft, and semi-floating rear axle with a reduction ratio of 4.9 to 1. Service brakes act externally on rear wheel drums with a diameter of 15 1/2-in. and a width of 2 1/2-in., while the emergency is on the transmission, its dimensions being 8 1/4 x 2-in.

Semi-elliptic springs, 2 1/4-in. wide, are used all around, those in front being 39-in. long as compared with 57-in. at the rear. Frame side channels have a maximum depth of 6 3/16-in. and are pressed from 1/4-in. stock. The tires are 30 x 5-in. mounted on 20-in. disk wheels using Firestone type B rims.

Lighting equipment consists of tail light, dome-light with automatic door switch, meter light, vacant light, cowl lights and spotlights. Head lamps are extra equipment.

AUTOMOBILE RACE ENTRIES

CHARLOTTE, N. C., Oct. 8—Fifteen automobile race drivers have signed contracts to participate in the Armistice Day 250-mile race on the one and one-fourth-mile Speedway here for a purse of \$10,000, according to a telegram to

Osmond Barringer, manager of the Speedway, from Fred Wagner, official starter, at Altoona, Pa. These drivers are Jerry Wonderlich, Jim Hill, Leon Duray, "Doc" Shattuc, Dennett Hill, Frank Elliott, Harry Hartz, Phil Shafer, Fred Comer, Bob McDonogh, Earl Cooper, Batten, Hepburn, Devore and Spooner.

G. M. Entertains Detroit S.A.E.

DETROIT, Oct. 7—Members of the Detroit section, Society of Automotive Engineers, and a number of their friends, were the guests recently of the General Motors Corp. at the proving grounds maintained by the corporation at Milford, Mich.

The members met at the offices of the section in the General Motors Building and were transported by automobile to the proving grounds near Lansing. The afternoon was spent in witnessing actual tests of passenger cars to determine their hill-climbing capacity, maximum speed, fuel economy, braking efficiency and other characteristics.

Following the afternoon program of inspection and demonstration, the members were the guests of the corporation at a buffet supper.

In the evening, O. T. Kreusser, resident engineer in charge of the proving grounds, read a paper on methods employed at the grounds in determining important characteristics of cars and accessories.

The proving grounds were established in 1924 on a tract of ground 1,125 acres in extent. A system of roads of widely varying character and gradient have been constructed, to give the cars actual tests under known conditions, on every sort of road that might be encountered in actual use.

French Air Lines Report Net Profit

NEW YORK, Oct. 6—According to G. E. Flandin, delegate to the Interparliamentary Union at Washington and president of the International Congress of Aerial Navigation, several commercial air lines in France show a substantial profit for the last three months. He says airplane traffic in France this Summer was unprecedented, and that 40 per cent of the passengers on de luxe planes were Americans.

This is the first time that airplane lines in France have shown net profit. These earnings were made without any subsidy. M. Flandin believes some subsidy will be necessary during the winter, but he expects even larger business next Summer, and adds:

"Due to the 97 per cent efficient schedules maintained by planes transporting passengers and freight from France to England and recent progress in aerial dynamics by French technicians, I foresee greatly reduced airplane operating costs."

Motor Bus Show to be an Annual Event

Detroit Seeks to Give Coming Exhibit a National Flavor. Many Exhibitors

DETROIT, Oct. 8.—A movement which is intended to make this city the motor bus capital of the country has been inaugurated in the form of plans for the First National Motor Bus and Coach Show on November 16-21 here. Approximately twenty-five bus manufacturers, between eighty and ninety parts' and accessories' manufacturers, and twelve bus body builders are expected to exhibit on this occasion. The show will be held in Grindley Hall, and arrangements are in the hands of a committee headed by C. E. Stone, chief engineer of the Peoples Motor Coach Co.

Buses to be shown include the latest developments in city, suburban, and inter-urban models. Mr. Stone stated that the number of exhibitors will probably be considerably in excess of the number announced so far. He stated further:

"If our program is carried out, we believe that we will establish the show as an annual National event. It will mirror to the Nation the progress that has been made and will serve as an indicator of what may be expected in the future."

Date of N.S.P.A. Show Moved Forward

DETROIT, Oct. 5—The date for the National Standard Parts Association Convention and Show was deferred from Nov. 5-7 to 16-18, by action of the board of directors last week. The show will be held in the new Annex of the Sherman House in Chicago, instead of in the Coliseum as originally planned.

There are available 91 show spaces in the Sherman Annex and of these 70 have already been contracted for, according to C. B. Frazer, manager of the show, who says that enough requests are already in his hands to assure every space being taken before the opening day.

The new dates for the National Standard Parts Show place it after, instead of before, the show of the Automotive Equipment Association, scheduled for Nov. 9-14 at Chicago. Further developments in the controversy between the parts association and the A. E. A. are thus deferred for a time. Directors of the A. E. A., previous to the action of the N. S. P. A. directors in changing the date for their show, had reaffirmed their decision not to sanction the N. S. P. A. show.

GARDNER SALES GAIN

ST. LOUIS, Oct. 7—Gardner Motor Co. reports September sales and orders on the books as 30 per cent above August, exceeding all months since April.

Exports, Imports and Reimports of the Automotive Industry for August of Current Year and Total for Eight Months Ending August, 1925

EXPORTS

	Month of August				Eight Months Ending August, 1925				
	1924	Number	Value	1925	Number	Value	1924	Number	Value
Automobiles, including chassis (total)....	14,587	\$10,973,950		33,244	\$21,059,469		121,233	\$86,987,530	
Electric trucks and passenger cars....	16	25,125		4	8,235		101	127,218	
Motor trucks and buses, except electric..									
Up to 1 ton....	1,642	654,198					14,100	5,758,141	
Over 1 and up to 2½ tons....	559	762,285		873	1,104,884		3,582	4,803,636	
Over 2½ tons....	152	375,322		171	488,991		994	2,418,132	
Total motor trucks and buses, except									
electric	2,353	1,791,805		6,724	3,728,293		18,676	12,979,909	
Total								34,310	22,077,904
PASSENGER CARS									
Passenger cars, except electric:									
Value up to \$500 inclusive....	5,314	1,951,891		15,081	5,625,575		40,608	14,758,531	
Value up to \$800....	2,956	2,075,489		5,000	3,514,800		29,684	19,996,547	
Value over \$800 and up to \$2,000....	3,579	4,106,812					29,832	32,600,579	
Value over \$2,000....	369	1,022,828		444	1,244,507		2,332	6,524,746	
Total passenger cars, except electric....	12,218	9,157,020		26,516	17,322,941		102,456	73,880,403	
PARTS, ETC.									
Parts, except engines and tires:									
Automobile unit assemblies (Lbs.)....	8,086,446	1,650,582	13,704,402	2,565,795	189,248,919		33,828,044	160,958,245	
Automobile parts for replacement (Lbs.)...	8,434,710	2,130,191	9,762,089	2,688,680	61,374,755		15,289,832	68,083,330	
Automobile accessories (Lbs.)....	1,150,012	503,991	1,804,996	766,151	12,694,279		4,628,209	13,084,185	
Automobile service appliances (n.e.s.) (Lbs.)	721,132	311,343	1,697,746	577,927	4,393,470		1,761,560	8,318,846	
Station and warehouse motor trucks (No.)	3	3,938	15	16,066	92		68,711	211	
Trailers (No.)....	114	26,406	40	21,800	340		129,706	372	
Airplanes (No.)....	5	29,500	1	1,100	49		299,677	63	
Parts of airplanes, except engines and tires (Lbs.)	8,075	4,481	4,301	7,099	126,648		141,851	79,488	
BICYCLES, ETC.									
Bicycles and tricycles (No)....	621	15,289	629	17,294	4,543		114,504	5,356	
Motorcycles (No)....	916	215,259	1,383	304,989	11,244		2,733,483	14,830	
Parts, except tires (Lbs.)....	167,079	104,613	259,725	156,463	2,048,812		1,104,800	2,037,750	
INTERNAL COMBUSTION ENGINES									
Stationary and portable:									
Diesel and Semi-Diesel....	153	13,445	190	57,304	1,247		412,591	662	
Other stationary and portable:									
Not over 10 H.P.	2,845	266,018	3,331	285,870	16,026		1,480,240	18,921	
Over 10 H.P.	211	115,276	165	229,571	1,788		1,128,999	1,818	
Automobile engines:									
Motor trucks and buses....	171	33,036	56	17,039	989		130,505	31,501	
Passenger cars	1,094	221,340	7,800	829,180	14,943		2,331,589	81,268	
Tractors	1,623	491,627	529	172,904	2,309		700,202	947	
Aircraft	1	375	3	11,030	121		185,149	32	
Accessories (Lbs.)	628,955	326,674	644,578	366,838	5,769,373		2,524,192	6,052,740	
IMPORTS									
Automobiles and chassis (dutiable) (No)....	37	41,650	65	104,439	308		538,665	399	
Other vehicles and parts for them (dutiable)	14,205	48,648		779,784	
REIMPORTS									
Automobiles (free from duty)	88	51,208	14	24,108	283		322,944	142	
									204,343

Oakland Official
Foresees Big Sales

PONTIAC, MICH., Oct. 7—A. R. Clancy, general manager of the Oakland Motor Car Co., announces that the October output of the Oakland factory is being increased more than 80 per cent over the preceding month.

"This increase is doubly significant," said Mr. Clancy, "because our September production was the highest of any month this year, exceeding the best previous month by 33 1/3 per cent. However, in spite of our volume of production in September, orders have continued to flood our home office since the announcement of our new cars, and the accompanying price reductions, making it necessary to provide a still greater increase in October. Before the end of the present month, our daily average production will have exceeded 350 cars, and we have already shaped our plans toward that end.

"Since the first week in October, the local unit of the Fisher Body Corp. has been devoted exclusively to the production of Oakland bodies. For some time, Oakland production has been taxing the Fisher plant to capacity with its steadily increasing volume.

"Work of re-arranging the Oakland plant to make possible this big increase has been under way for some time, and we are confident that the middle of October will find everything adjusted and the new schedule in full operation.

"The combination of incorporating many refinements in the car, and materially improving the motor by means of the new Harmonic Balancer, coupled with the reduction of \$70 to \$350 in prices, has pushed business to a record level, and we are anticipating a heavy demand for some time to come."

FORM CLEVELAND COMPANY

CLEVELAND, OHIO, Oct. 8—R. B. Clark, W. K. Fleming and A. M. Baer announce the formation of a manufacturers' agency to be known as Clark, Fleming & Baer, with offices at 1400 West 25th St. They are graduate engineers, manufacturing and sales experience equipping them to handle sales of radio, automotive, electrical and mechanical lines. They plan to cover all classes of trade in Northern and Central Ohio, as well as the distributing trade in surrounding territory and they are prepared to handle National distribution. They are in the market for a limited number of additional lines.

Kelly-Springfield
Removes Factory

AKRON, Oct. 6—Officials of the Kelly-Springfield Tire Co. have definitely decided to abandon the East Akron factory, Louis Mueller, general superintendent, has just announced. The company plans to concentrate its production at the new factory in Cumberland, Md. Operations here are to be discontinued at once, the factory dismantled, and the property placed on the market for sale. Capacity of the Akron plant is about 3,500 automobile tires a day, but recently it has been running on a considerably reduced schedule. Approximately 500 workers have been employed.

Kelly-Springfield discontinued manufacturing tires here when the Cumberland plant was completed five years ago. Two years ago the local factory was reopened. It was reported at that time that the scarcity of experienced rubber workers handicapped operations at the new plant. Another theory advanced for the change was that the company was working on large orders for Detroit motor car manufacturers, which made it advisable to have production as near that city as possible.

Developments of the Week in Leading Motor Stocks

NEW YORK, Oct. 7—There was a sharp division of interest as between the credit situation affecting the fundamental position of the stock market and the speculative movements of individual stocks. The firmer tendency of money rates, both for call and time accommodation; the reduction in the Bank of England rate and the discussion of the action to be taken by the Federal Reserve Bank here all served for an endless round of academic discussion. The continued strength of the shares of companies identified with the automotive industry, with less pronounced tendencies in other groups, were outstanding characteristics of the speculative market. According to one's individual proclivities, one might say that stocks were strong, weak or colorless, for advances, declines and inertia were equally in evidence.

The action of the Bank of England governors places the domestic credit situation in a peculiar position. Practically throughout this year there has been acute business depression in Great Britain. The common economic result has been witnessed as funds have accumulated, due to the slowing down of industry. In addition, there have been large deposits of American capital left in London as a result of trade operations. London money rates, consequently, have been low.

If the Federal Reserve Bank at New York were to raise its re-discount rate, there would inevitably follow the withdrawal of American balances in London, for capital is internationally minded and flows to the point of highest return. Such a movement at this time, coming at the season when Great Britain must make payments here for cotton and grain, would seriously jeopardize the maintenance of the gold standard in Great Britain. It is perfectly well known that American bankers are working with these of London to maintain the gold standard abroad.

The great public speculation in the stock market, which has been in progress for a year, has resulted in an abnormal absorption of credit for speculative purposes. Collateral loans of member banks are at the highest point in history. Commerce and industry are beginning to make their claims for credit in response

to expanding demand for goods. Thus, the banking authorities are faced with the problem of reducing collateral loans to supply the needs of industry and the easiest way would be to increase the Federal Reserve re-discount rate. But this would make more difficult the position of the British Government. The banks, by marking down the percentage loaned on speculative stocks, has sought ineffectually to curb speculation. It is common knowledge that, in many of the more active and volatile speculative stocks, from 50 to 90 points were taken off the loan value. This, however, has not curbed speculative activity and attests the financial strength of the market sponsors of these issues. Whether or not Federal Reserve will advance the re-discount rate, extending the available \$300,000,000 of credit to support sterling exchange temporarily, is a question. It would be one way of solving the present credit problem.

Probably the greatest amount of public interest centered in transactions in Dodge Bros., Inc., the common stock advancing some 10 points on an enormous volume of trading. This market movement was designed solely to make attractive the conversion privilege of the various series of bonds issued at the time of the sale of the property. Something more than \$4,000,000 of the third series of \$5,000,000 Dodge sixes has been converted, and, of the total of \$30,000,000 subject to conversion, slightly more than \$14,000,000 has been converted. The full amount which may be converted at 40 is \$5,000,000, and the next conversion point is 50. Because of this latter figure, it has been accepted as an objective for the speculative interests making the market.

Strength and activity in Willys-Overland was due to the production figures and shipments reported by the corporation. From January 1 to September 15, more than 155,000 cars were shipped; 10,500 being shipped in the first 15 days of September. A committee has under consideration a plan for the payment of the back dividends on the preferred stock and there have been rumors of unexpectedly favorable action to be taken.

In the case of Nash Motors, September business was 83 per cent. greater than the same month last year. The new Ajax sixes have found a large market,

5,000 of these cars having been sold in the four months of production. It is planned to double the capacity of this plant. Hupp Motors was active just before directors declared the regular 2½ per cent quarterly dividend. Production figures of the company are slightly below those of last year. A flurry in American Bosch Magneto followed estimated earnings for September of \$60,000, after interest and depreciation, and an estimate of \$121,000 for the third quarter compared with a loss of \$51,000 in the same period last year. Plans for the readjustment of the capital structure through the sale of 69,133 new shares and retirement of 2,125,000 8 per cent notes will effect an annual interest and sinking fund saving of nearly \$1.50 per share on the 207,399 shares which will be outstanding when the readjustment is completed.

United States Rubber led this group in a sharp advance to a new high level for the present market. The advance was accompanied by estimates of earnings which ran as high as \$10 per share for the year, and coincided with cabled reports from London of a decrease in crude rubber stocks at the center, and a firmer price. The plan for splitting up Miller Rubber Co. stock on the basis of 5 for 1 with the right to subscribe to preferred stock at \$103.50 per share served to fire the speculative imagination on reported melons to be given holders of stocks of other companies.

There have been many supporters of the theory of an advance in the railroad shares, but these have failed to reward their followers. August earning's statements were very favorable, yet these stocks failed to reflect them. This raises the question of what would be necessary to bring about an advance in these stocks. Sugar stocks again were heavy in response to the new low record for raw sugar made during the week. Copper stocks were dull, but firm, despite the decline in the metal market. Trade sentiment is hopeful and expects a revival of European and domestic buying within the next few days and there are authorities who predict a level of between 15 and 16 cents for the metal by the end of the year. Activity in the merchandising stocks was in anticipation of holiday trade.—H. H. S.

North East Service Holds 1925 Convention

ROCHESTER, Oct. 6—R. J. Kelleher has been elected vice-president and general manager of North East Service, Inc., it was announced at the convention of branch managers held at the plant of the North East Electric Co., in Rochester, last week.

Mr. Kelleher has been manager of the Paris branch of the organization since 1920. Previous to that he was manager of the Kansas City office, and later of the Detroit office.

The 1925 convention of the North East Service, Inc., branch manager, lasted a week, and was attended not only by managers of branches in this country, but also those in Toronto, London, Paris and other foreign cities. Daily addresses dealt with the further development of the North East Service policy to meet demands of the present and future. Entertainment features included a theatre party.

The convention adjourned Saturday to Atlantic City, where the branch managers will attend the National Electric Railway Association Exposition.

Ford Makes Trolley Columns and Arches

DETROIT, Oct. 7—A Ford plant at River Rouge is now turning out daily six reinforced concrete trolley columns and six half-arches for the projected electrification of the Detroit, Toledo & Ironton Railroad.

These units are made in a specially designed group of buildings on two 242-foot assembly lines, one carrying columns and the other half-arches. Ten caps are formed and cast separately each day.

Ten-Day Hearing on Taxes Planned

Bill to Lift Burden on Industry Regarded as Privilege

WASHINGTON, Oct. 7—Ten days have been fixed as the maximum time for hearings on the tax-reduction bill in the House ways and means committee, which proposes the repeal of the war excise tax on automobiles and on accessories and parts. After the hearings the committee will begin preparation of the new legislation for submission to Congress when it convenes in December.

The hearings will begin October 19 and Chairman Green announces that as soon as the House is organized and committee members elected, the bill will be reported and introduced. It has been tentatively decided that representatives of the automotive industry will be among the first called to testify.

"I can see nothing to prevent passage of the tax bill before the holiday adjournment," Green declares. "Under the rules the bill is privileged. It can be called up at any time, and, while some other bills are privileged, it would, in my judgment, be clearly entitled to preference, I am satisfied there will be no controversy on this point."

Two prominent members of the Ways and Means Committee have given assurance to the American Automobile Association that they will give 100 per cent support to the program for repeal. A statement to this effect was issued jointly by Congressman William A. Oldfield, Dem., Arkansas, and Congressman James W. Collier, Dem., Mississippi.

Legislation to Control Bus Lines

WASHINGTON, Oct. 8—Passage of legislation by Congress at its coming session to regulate interstate bus lines is regarded as certain by the American Automobile Association, which has just sent to state bus associations an appeal for united action on the serious question facing bus operation today.

Among the proposals expected to reach Congress are:

Issuance of certificate of convenience and necessity through the Interstate Commerce Committee or some other Federal regulatory body. This might include a "grandfather" clause providing that lines in operation prior to the act would automatically receive certificates. But the Association believes that such legislation would put many lines out of business.

Rate regulation, possibly based on the railroad standard of 3.6 per mile.

Application of the entire Railroad Transportation Act of 1920 to the bus business, arbitrarily limiting earnings to 5% per cent, with profits exceeding this amount to be recaptured by the Government.

Centralization of authority in one agency such as the I. C. C., which would mean expensive trips to Washington or to other points designated by the I. C. C. for hearings, and also long delays after hearings before operating permits were granted.

Power to act as agents of Federal Government may be delegated by Congress, or by the I. C. C., to state regulatory bodies, with the result that interstate bus lines not now holding state certificates would not be given Federal certificates.

Amendment of state regulatory laws in order to conform with Federal regulation may follow an act of Congress, reopening the whole question of bus regulation in each state and jeopardizing the results of hard won victories in many states.

The Association says that some of these proposals are backed by interests opposed to the bus and some may benefit the industry, but "who is going to decide what is best for bus owners and then fight for it?"

It is pointed out that there are now two organizations purporting to represent bus owners, the National Motor Bus Association and the A. A. A. bus division. The A. A. A. adds that eventually there will be but one national organization, that state associations cannot afford not to join a national association without delay, and that every effort should be made to consolidate the two.

Ajax Production is to be Doubled

KENOSHA, WIS., Oct. 7—Production capacity at the Ajax Motors Co. factory is to be doubled. Active work preparatory to the installation of new machinery has begun.

This announcement, four months from the time the first Ajax was run out for shipment, is regarded by officials of the company as indicating the enthusiastic reception of this new Nash built car.

Ajax Motors celebrated its fourth monthly birthday by shipping the 5000th car to leave the plant since May 26th. Officials say that only about one-fifth of the leading cities have been covered so far in distribution.

"Because of its engineering features and design we knew that the Ajax would occupy a field entirely new," says D. M. Averhill, vice-president and general manager. "For weeks the factory has been increasing production steadily, with cars moving almost immediately from dealers to buyers. We have been forced to prepare for doubling production capacity sooner than we had originally planned."

PARTS CO. TO ENLARGE

OSHKOSH, WIS., Oct. 8—Wisconsin Parts Co. has let contracts for additions, for completion Dec. 1, which will practically double floor space of the present factory. According to W. F. Rockwell, general manager, this concern has increased its business nearly 50 per cent every year since 1921.

FINANCIAL NOTES

India Tire and Rubber Co.—Owing to the great increase in business this year officials of this company are planning to build another addition to the plant in 1926.

President J. M. Alderfer announces that net sales for the first six months of this year totaled \$2,220,221. This was 89 per cent greater than the corresponding period last year.

"Despite the fact that our plant ran to its fullest capacity from January to September, we have been constantly behind on orders, Mr. Alderfer says. "Our daily production has increased far beyond anything that had ever before been necessary."

Net profit, after taxes, for the six months ended June 30, was \$314,655, which, after preferred dividends, was equivalent to \$27.70 a share on the common stock.

Miller Rubber Co.—Common stock of this company will be split up on the basis of five shares of new, no par common stock, to be issued holders of each \$100 par value share, if the reorganization plan proposed by directors is adopted, President Jacob Pfeiffer has announced. A special stockholders' meeting will be held Oct. 19 to act on the proposal. The plan includes selling \$4,000,000 par value of the unissued cumulative preferred stock at \$103.50 a share. Stockholders will be offered the right to subscribe for four shares of preferred for every five shares of old common held.

Total authorized capitalization under terms of the reorganization will be 600,000 shares, of which 400,000 will be common no par value and 200,000 8 per cent cumulative preferred. Subscriptions for the 40,000 shares of new preferred stock must reach the company by Oct. 10. Sale of this stock will bring the total outstanding preferred stock to \$12,500,000. An affirmative vote of two-thirds of the outstanding common stock of the company is required to adopt the proposed reorganization plan.

President Pfeiffer, in a letter to stockholders, states the company has a large and profitable business on its books, and in immediate prospect. "In order to accept the business available, it is advisable to increase working capital," he says. "Directors deem it advisable also to modernize the company's capital structure and provide a better market for your common stock."

Durant Motor Co. of New Jersey—This company, largest of the Durant Motors, Inc., divisions, occupying part of the plant at Elizabeth, with 2,100,000 square feet of space, with capacity for 150,000 cars per year, had net assets of \$7,904,216 on June 30, compared with \$9,600,000 on December 31, 1924. Current debt increased in this eighteen months' period from \$2,118,746 to \$3,303,335 but funded debt was reduced from \$3,038,458 to \$2,625,499.

For the first six months of 1925 production was practically at the 1924 rate. In that year 31,647 cars were produced, mostly Star models. Deficit for the six months was \$536,722, bringing the total to \$1,735,784. Of the current liabilities it is estimated that a little more than half represent inter-company indebtedness.

All capital stock of the New Jersey division is owned by the parent company.

Charles Freshman Radio Corp.—Charles Freshman, president, announces that directors have suspended the quarterly dividend of 50 cents in order to conserve cash resources.

Aviation Progress Meeting Subject

Racing Plane Development Also Discussed by S. A. E. in New York

NEW YORK, Oct. 7.—Aviation progress and the evolution of racing planes were discussed at the aeronautic meeting and dinner held by the Society of Automotive Engineers at Hotel Astor tonight.

Racing plane development was covered in a paper by W. L. Gilmore, engineer of the Curtiss Aeroplane & Motor Co., read at the afternoon session by C. M. Keys, president of the company, who was also a speaker at the dinner.

Mr. Gilmore is given credit for the engineering work which resulted in a type of pursuit plane for the Army that has covered 260 miles per hour on a level course under adverse conditions.

Henry M. Crane, technical assistant to the president of the General Motors Corp., was toastmaster and explained the aeronautic safety code just published by the S. A. E.

J. E. Whitbeck, superintendent of the eastern division of the Air Mail Service, discussed air mail operation. W. B. Stout, in charge of the Stout Metal Airplane Division of the Ford Motor Co., described lessons learned in the operation of the Detroit-Chicago airplane express service established by the Ford concern, and J. Parker Van Zandt of the Department of Commerce told of the reliability of the European air lines in transporting passengers, mail and express.

Guests of honor included Mons. P. E. Flandin, president of the Aero Club de France; Louis Breguet, French airplane manufacturer; Orville Wright, Brig. Gen. J. E. Fehet, assistant chief of the U. S. Air Service; Paul Henderson, formerly third assistant Postmaster General, who established the Air Service and is now manager of the National Air Transport Co., of Chicago; Group Capt. M. G. Christie, air attache of the Italian embassy.

Moskovics Foresees Big Stutz Sales

INDIANAPOLIS, Oct. 7.—A report just issued, covering third quarter production of cars by the Stutz Motor Car Co. of America, Inc., shows an increase in production over last year's records of 213 per cent. The report also shows a marked increase in distribution, with many new distributors and dealers added at important points, indicating that the present marks an unusual point in the development of the institution.

"The work of the last six months" says president Fredrick E. Moskovics, "has been chiefly directed at rounding out the Stutz distributing organization, and we now have assurances that, by

the first of the year, Stutz will be well represented in every important market in the country. During the same period we have made important forward strides in Stutz production methods and are now in a position, both from a production and a distribution standpoint, to do a greater business in 1926 than has ever been known in the history of the organization.

"The recent addition of Edgar S. Gorrell to our organization as vice-president brings into our executive family another man who is thoroughly familiar with the problems of distribution from actual experience both as a distributor and manufacturer. Our plans for the future are all based on practical experience, and while we are gratified with the success of the last few months, we feel that the coming year will eclipse every effort of the past.

Economies of Future Distribution

"Today we hear a great deal of the economies effected in the production end of the automobile industry. A recent report of one of the leading manufacturers stated that they were producing as many cars with 11,000 men as were formerly produced with 17,000 men on the pay-roll. Another manufacturer has claimed a reduction of one-half in men employed, with production figures for the smaller group exceeding those of the larger. While we feel that there are many economies being effected in manufacture, we at the same time believe that the greatest economies of the future are going to be centered around the problem of distribution. Our policies include no sacrifice in design, materials or workmanship for Stutz cars. In fact, we contemplate making Stutz cars better than ever before, but we are vitally concerned in new policies in relation to sales, the used car problem, distributors' overhead and wasteful advertising and sales' expenditures which have steadily increased the cost of selling.

"We believe the buyer of the car is more interested in saving from the cost of selling than he is in saving at the cost of production expenditure. Every dollar that is wasted in distribution must be paid by the buyer of the car. We believe our distributing policies, without sacrifices of profit to the dealer and distributor, will make important savings to the buyer. Our present distribution organization, including our six branches in the larger cities, and established responsible distributors and dealers at other points, is reflecting a policy 'helping the owner to buy,' rather than going into high-pressure sales methods. And on this basis we anticipate a shortage of Stutz cars in the coming months, even in view of our plans for larger production."

WELDING SOCIETY TO MEET

CAMBRIDGE, MASS., Oct. 8.—The Fall meeting of the American Welding Society will be held at the Massachusetts Institute of Technology, Cambridge, Oct. 21-23. T. A. Wry, General Electric Co., 920 Western Avenue, Lynn, Mass., chairman of the exhibit committee, will supply tags to manufacturers for shipping goods for exhibition.

Special Tool-Tax Reduction Allowed

Decision in Pierce-Arrow Favor of Wide Interest to Industry

WASHINGTON, Oct. 7.—A decision of wide significance in the automotive industry was rendered here recently by the United States Board of Tax Appeals when that body declared reasonable deductions claimed by the Pierce-Arrow Motor Car Company for depreciation on special tools and patterns in the company's tax returns for 1917 and 1918.

The taxpayer in the original return for 1917 claimed \$176,940.76 for suit depreciation and in 1918 claimed \$849,462.72 for depreciation and amortization. A revenue agent having objected to the 1918 deduction, the taxpayer filed amended returns, claiming \$489,438.74 for 1917 and \$776,708.07 for 1918. The Commissioner cut the allowances to \$287,361.95 for 1917 and \$488,145.53 for 1918, causing the company to appeal.

The Tax Board figured that the company was entitled to deductions of \$506,184.15 in 1917 and \$722,858.98 in 1918.

Spring Clutch Co. Plans Expansion

INDIANAPOLIS, Oct. 7.—The American Spring Clutch Co., which a few months ago brought out the L. G. S. Spring Clutch Starter Gear, today bought the property of the Hunter Dry Kiln, a plant of two stories with about 15,000 feet of space, and will manufacture there automobile starter gears, shock absorbers and other devices, with the spring clutch basic idea, and will also produce other devices.

At the same time the company announced that the Spring Clutch Co. had bought the property of the Central Gear and Manufacturing Co., owned and controlled by individuals interested in the newer company. This concern has been the manufacturing end of the Spring Clutch Co. and has also produced gears and gear blanks and automotive screw devices.

Another operating company will be formed next week by the officers and owners of the American Spring Clutch Co., to be called the L. G. S. Co., and this concern will lease the patents controlled by the Clutch Co. The officers of the concerns are Albert Lieber, president; W. Carlton Starkey, vice-president and general manager; Frank Gritt, secretary; and Charles Rutherford, treasurer. The reorganization is for expansion and to draw the concerns which have been organized separately into a unit. The officers own all the stock of the interests and no stock is to be offered for sale. It is understood that a rapid expansion of the business is expected.

California Car Dealers and Owners Pay Least Insurance

State Automobile Association Succeeds in Having Rates Reduced to Level Far Below that of Other States

SAN FRANCISCO, Oct. 6.—Automobile owners and dealers in automotive vehicles pay the lowest insurance rates in California of any state in the Union, according to the results of a survey just completed by the California State Automobile Association, which has 58,000 members in the state. Due to the efforts of this association the cost of automotive insurance in California has been lowered until motorists of other states pay from 66 to 331 per cent more than do those of the Pacific coast commonwealth. Rates for insurance on passenger cars, of course, vary with price and type of body, but the difference between the rates charged in seven large eastern cities by "board" companies and the rates charged on the same cars by the same companies in Los Angeles and San Francisco is shown by the following table in which touring cars representative of various price-types are enumerated:

	Dodge	Buick	Ford	Cadillac
San Francisco & Los Angeles	\$81.63	\$106.30	\$74.68	\$150.25
Detroit	165.85	209.83	132.58	253.00
St. Paul	171.19	215.00	136.24	248.75
Jacksonville	178.01	251.57	150.81	255.87
Pittsburgh	245.05	315.78	200.37	385.49
Chicago	245.49	316.43	200.56	388.12
Philadelphia	261.05	333.78	216.37	407.49
New York	351.70	444.61	299.31	543.12

The table is based on rates as of August 15, 1925. "In smaller cities, and in rural districts," says the association report, "the rates are lower than those shown here, but a proportionate disparity continues to exist as between the low rates in California and the tremendously higher rates in the East."

The figures in the table represent the premium charged by the same board companies, east and west, for a "full coverage policy," that is, fire and theft for the usual amount, according to value; collision damage, property damage of \$1,000, and public liability of \$5,000 to \$10,000. The rates for other makes of cars vary, but the difference between California rates and the eastern rates applies to all makes.

The survey of insurance rates made by the C. S. A. A. was called forth by the appearance—so far in California only—of an organization known as the "National Automobile Club." The state association, which has the support of the great majority of the distributors and dealers throughout the state, charges that the "National Automobile Club" is an organization formed, financed and operated by insurance companies and their agents in an effort to get control of automobile insurance in the state away from the state association, and then restore the rates to their previous high levels.

In presenting this situation to the dealers' organizations and to the motorists of the state, the California State Automobile Association says:

The "National Automobile Club," although both its name and its emblem imply otherwise, is operated as an automobile club only in the state of California. It was formed and is operated by a group of private automobile insurance companies. It is incorporated with a capital stock of \$500,000,

controlled by the Pacific Coast Automobile Underwriters' Conference, which is the organization that fixes the rates to be charged California motorists by all "Board" companies. The nucleus of the "club's" membership is composed largely of men in the insurance business. The selling of memberships to motorists is carried on by representatives of insurance companies. The purpose for which the "National Automobile Club" was formed was to retard the growth of the California State Automobile Association. The circumstances which led up to its organization were these:

For the past eleven years, members of the California State Automobile Association, acting co-operatively, without profit, through its inter-insurance bureau, have been obtaining their automobile insurance at cost, thereby effecting for themselves premium savings amounting in the aggregate to more than \$1,380,000. These savings, together with its superior loss-adjustment service, have had the effect of attracting automobile owners to the association in ever-increasing numbers. In an attempt to combat this co-operative movement, the private insurance companies have repeatedly reduced their rates in this state, with the result that California motorists are now enjoying the lowest automobile insurance rates in America.

Despite these combative measures by the private insurance interests, the inter-insurance bureau of the C. S. A. A. has continued its rapid growth until for some time past it has been the largest carrier of automobile insurance in this section—the association, meanwhile, becoming the second largest individual organization of motorists in the United States. In a final effort to check the growth of the C. S. A. A., and thereby stem the growing tide of co-operative automobile insurance, the private companies have now formed the "National Automobile Club" as an adjunct of their selling organization.

NEW PLANT OCCUPIED

DELPHOS, O., Oct. 7.—The Gramm & Kincaid Motors, Inc., announces that the company has just moved into its new plant here, located fourteen miles from its general offices at Lima, O. The company manufactures motor trucks and coaches.

City Planning is Traffic Solution

Macauley Reaches This Conclusion After His Survey of Cities

DETROIT, Oct. 7.—Alvin Macauley, president of Packard Motor Car Co., believes that city planning is the only real solution of the problem of traffic congestion. After a survey of first-hand information from hundreds of cities all over the United States, the majority of which report that this problem is growing steadily worse, Mr. Macauley in a brochure entitled "City Planning and Automobile Traffic Problems," reports the outstanding fact that "the important traffic streets of a large proportion" of these cities are inadequate "for either moving traffic or stationary vehicles which must use them."

While about half the cities have planning commissions, Mr. Macauley says very few have taken these commissions and their plans with any degree of seriousness; and while about one-third have made some study of traffic conditions, very few have used traffic studies in planning street layout, and only about one-fifth have any kind of plan for future street development.

"The smaller cities," says Mr. Macauley, "can still prevent conditions which must otherwise be inevitable, by making full use of the experience gained by the larger cities. It is cheaper and easier to plan than replan, to build than to rebuild. The police officials and their advisors in many of the large cities have used commendable ingenuity and patience in untangling traffic tangles and inventing schemes for preventing them. But the end of such measures is near—what is now needed is engineering ability and not police power. When the cities and their traffic commissions begin to find that the traffic problem cannot be solved by putting drivers in jail, they will turn their attention to the streets. We have been so busy boosting highways to take a man from one city to another that we have given no thought to what happens when he gets there. But now we must add to the slogan of 'Good Roads' one of 'Better Streets.'"

Locomobile Adds to Plant Facilities

BRIDGEPORT, CONN., Oct. 7.—Geo. E. Daniels, vice-president and general manager of Locomobile Co. of America, Inc., announces the installation of a new 500 K. W. generator and uniflow engine in that company's plant here.

All power used by the concern in producing the junior eight and the standard Locomobile is now generated on the plant's own grounds.

The factory expects to be producing 50 cars daily by January 1. Present production is between 25 and 30 cars daily.

Dust May be Used as a Motor Fuel

Coal and Alcohol Are Also Considered as Substitutes for Gasoline

NEW YORK, Oct. 7—Dr. A. C. Fielder, chief chemist of the United States Bureau of Mines, addressing the American Chemical Society's symposium on motor fuel and oil conservation here recently, said that America must turn to coal as a fuel source when gasoline stocks begin to vanish. Dr. Milton C. Whitaker, president of the United States Industrial Alcohol Co., addressing the same body, said that the superiority of alcohol over gasoline fuels is now established by actual experience.

Use of dust as a possible motor fuel is being investigated by the Bureau of Chemistry of the Department of Agriculture, according to Mr. Noel. He added that carbonaceous dust exists in huge quantities.

A device corresponding roughly to a one-cylinder combustion engine was exhibited. In this engine small quantities of carbonaceous dust, such as powdered sugar, cornstarch, cocoa, pulverized wood and finely-ground coal, was mixed with air and exploded by an electrical spark.

Years ago the Bureau of Mines learned that coal dust suspended in air was inflammable, causing mine explosions and that explosions in flour mills were caused by dust. The plan to use waste dust as motor fuel was one of the products of the investigation of means to prevent such explosions.

New Cletrac Model Being Introduced

DETROIT, Oct. 6—A new Cletrac, Model K, has been introduced by the Cleveland Tractor Co., Cleveland, O., listing at \$1875 f. o. b. The model K is declared by Cletrac officials to offer all the engineering advantages of the crawler construction, plus new features that make it a most practical heavy duty tractor in the industrial or agricultural field.

The new machine is claimed to handle an 8-foot grader with full bite, and to easily pull a three-bottom 14-inch plow. Its turning radius is its own length. Rocking motion has been eliminated by the use of seven closely assembled lower track wheels, which assembly also insures a maximum of track gripping the ground.

Special Feature

The new model has an instantaneous oiling system, by which a single push of the hand lever thoroughly oils the track wheels without stopping the tractor. Protection is afforded the oiling system by the hollow steel cast construction of the side frame, under which the lower track wheels are assembled.

Commercial Airplane Proves Reliability

DETROIT, Oct. 6—An example of airplane reliability in the commercial field is the announcement made today of the mileage covered by air transports of the Ford Motor Co. Regular air express service has been maintained by the company between Detroit and Chicago and between Detroit and Cleveland. The announcement of the exact figures made today covered the day's run to Cleveland and Chicago.

The schedule of flights, complete to Oct. 1, covered 76,000 miles from April 13, 1925, the date the service was inaugurated. During that time the airplanes made 298 trips and carried 259,518 pounds of freight. Although this transportation is devoted to express or freight loads, it has established a record for speed eclipsing the most rapid railway trains.

The average speed maintained between Detroit and Chicago has been in excess of 96 miles per hour, while on the Detroit-Cleveland run, the planes have averaged more than 100 m. p.h. No effort has been made by the Ford planes to attain speed records.

During the time of operation, only six forced landings have been made, three of which were due to slight mechanical disorders, requiring but minor adjustments. The other three were occasioned by storms that caused poor visibility.

Front and rear sprockets are kept in alignment by this side frame as well.

Quick adjustment of the crawler tracks is made possible by a regulating screw. The transmission case contains all driving and reduction gears, leaving a single sprocket wheel outside to drive the tracks. All rotating bearings are anti-friction. The two adjusting bearings in the differential are taper rollers; the remainder are ball bearings. Differential case covers and bearing sleeves are one steel forging.

Accessibility is an important feature, practically all parts being removable without disturbing the entire assembly. Two speeds ahead and one reverse are provided.

FIRM CHANGES NAME

NEW ORLEANS, Oct. 6—Coincident with the removal of Abbott Motors, Inc., to a new building, especially designed and constructed for the distribution of Packard cars in the New Orleans territory, and located at 1711 St. Charles Avenue, Ginder Abbott announced a change of name to the Packard-New Orleans Co. The reason for the change of name is found in the fact that New Orleans is rapidly becoming a tourist center, and the new name will make it easier for out-of-town Packard owners to identify the New Orleans distributors.

Ford Car Financing Warning Issued

Company Advises Dealers to Insist on 25% Down and Balance in a Year

New York, Oct. 6—Has the Ford Motor Co. definitely abandoned the plan whereby, in some sections, cars have been sold for as little as \$12.60 down payment? Metropolitan dealers have been asking this question as the result of letters received through the New York branch carrying the statement that 25 per cent down with twelve months for the payment of the balance, are the minimum terms that can wisely be accepted by dealers.

\$1260 Down Payment Condemned

One thing seems certain, namely that there is little likelihood of the \$12.60 plan being put into effect in the New York district. This plan is condemned, indirectly, in the letters, one of which says:

"In line with good merchandising and our experience, we do not believe it advisable to accept time payments on Ford cars for a less down payment than 25 per cent and we believe that twelve months should be sufficiently long to clean up the transaction. This letter is induced by the fact that many dealers are selling on plans of 20 per cent down and in some cases even less. We do not believe this necessary, nor do we believe that it serves our best interests."

Ford Position Amplified

Another letter, sent out when the new models began coming through amplified this position:

"At the outset and for the average business on deferred payments, we believe in a standardized system of handling, in uniformity of financing plans, and our reasons are very obvious.

"With the delivery of the improved models, we suggest that all dealers sell on the old plan of one-third down and twelve months for the balance. If it is necessary in the heavier winter months, the inducement of a quarter down and twelve months might be the other barrel to use at that time, but not now. Any other plans or ideas for the transaction of the general run of time payment business leads to certain questionable results. When endorsement is required on notes, the endorser never expects to make good and if he is required to do so, he doesn't blame his friend, he damns the car and the dealer.

Banks' Attitude Considered

"Whenever a car is repossessed, what do the friends hear? They get anything but the truth and again you and the product suffer. Then greatest of all is the attitude of the general banking interests toward our business. We want to retain their present interest and willingness to assist in the financing of our future transactions."

Men of the Industry and What They Are Doing

Horton Manages New Zone

A new zone headquarters has been opened by Chevrolet Motor Co. in the Fisk Building, covering Greater New York, Long Island, Metropolitan New Jersey and the East coast of that State to the Pennsylvania line, including Trenton, in charge of H. L. Horton, for three years manager of the Philadelphia zone.

This territory was formerly covered by the factory organization at Tarrytown. Previous to taking over the Philadelphia zone, Horton managed the New York retail headquarters. Active management of the new zone will be in charge of J. S. Montgomery, formerly a sales promotion man in the Philadelphia territory. George H. Schmidt, also from the Philadelphia office, will be assistant zone manager, and F. J. Kohl will be service manager.

Longan Succeeds McCain

Lou W. Longan, Link-Belt chain transmission engineer, has been placed in charge of the Link-Belt silent chain front-end drive division of the Link-Belt Co. in Detroit, succeeding George L. McCain, according to an announcement by Julius S. Holl of the Link-Belt Co. executive offices, Chicago.

In his new position, Mr. Longan's many years' experience in the entire field of silent chain application, both to the front-end of automobiles and to industrial uses, are placed at the disposal of automotive engineers.

Mr. Holl says that since the Link-Belt concern originated and adopted the Link-Belt automatic chain adjustment in connection with its silent chain front-end drive installation, business has expanded until today Link-Belt silent chain drives are standard on thirty-two passenger cars, seven trucks and five motors.

Sayler Adds to Territory

C. E. Sayler, Klaxon representative in Arkansas, Kentucky and Tennessee, has been assigned the additional States of Virginia, West Virginia, North Carolina and South Carolina in a recent change announced by R. L. Wilkinson, Klaxon sales manager. Mr. Sayler succeeds Allen Wescott, who has become identified with the General Motors Export Corp. Part of Wescott's former territory, including Washington, D. C., and Maryland, has been assigned to A. H. Dittig, Klaxon representative in Pennsylvania, New Jersey and Delaware.

Champion Sails for Europe

Albert Champion, president of the AC Spark Plug Co. sailed for Europe from New York yesterday on the "Berengaria." This is Mr. Champion's annual trip in the interest of the company's European factories, located at Birmingham, England and Paris, France. While abroad he will also attend the Olympia Show in London.

CAMPBELL ANNOUNCES REGIONAL MANAGERS

NEW YORK, Oct. 8—Effective Oct. 1st, Colin Campbell, vice-president of Durant Motors, Inc., announces the appointment of B. A. Rupprecht as regional sales manager of the Southeast region, comprising Cincinnati, Greensboro and Atlanta zones, and two new zones with headquarters in Louisville and Jacksonville.

Rupprecht was formerly sales manager of the Cincinnati zone and his headquarters will continue in that city.

E. D. Knowles has been appointed Middle Western regional sales manager, comprising Denver, Kansas City, St. Louis, Memphis, Dallas and Oklahoma City zones. He formerly managed the Denver zone and his offices will be at Kansas City. R. C. Nisbit succeeds him in charge of the Denver zone.

T. E. Jarrard continues as manager of the Great Lakes region from his Lansing offices, and A. Van Der Zee, at Elizabeth, N. J., manages the Atlantic Coast region. New sales managers of the Cincinnati, Louisville and Jacksonville zones will be announced later.

Annual Outing Held

Members of the Philadelphia Automobile Trade Association held their annual outing at the North Hills Country Club near Philadelphia last week. The program included golf tournaments, a dinner in the evening, and other amusements.

C. J. Stover cleaned up most of the prizes, including one year tenure of the president's cup, and both low gross and low net on the final 36 holes in the afternoon. Lacy Redd, Charles Engard and H. C. McConnell were the other prize winners.

Litchfield Returns From Europe

The future of commercial aviation lies in development of giant Zeppelin airships for trans-oceanic travel, according to P. W. Litchfield, vice-president of the Goodyear Tire & Rubber Co., Akron, who has just returned from Europe. Voyages by air between New York, London and Paris will soon be a reality, he predicted.

Opens Gardner Branch

Gardner Motor Co., Inc., has opened a wholesale factory branch at 2001 Michigan Ave., Chicago, in charge of Holm Walker, well known Chicago automobile merchandiser. This branch will carry a complete stock of parts and warehouse Gardner cars for dealers.

Peabody is Appointed

C. W. Haddon, general sales manager of Velie Motors Corp., announces the appointment of F. D. Peabody as district representative in Pittsburgh. For several years he was connected with the Studebaker organization in various sales capacities, and for the last year he has been connected with the Chrysler sales organization.

Funkhouser Vice-President

R. D. Funkhouser, formerly assistant secretary and treasurer, has been chosen vice-president of Delco Light Co., a General Motors subsidiary.

Morgan Director of G. M. C.

At a special meeting, Junius S. Morgan, son of the late J. P. Morgan, was elected a director and member of the finance committee of General Motors Corp.

Horning on the Coast

H. L. Horning, president of the Society of Automotive Engineers, was the guest of honor recently at the monthly dinner of the San Francisco chapter of the S. A. E. Mr. Horning made a special trip from New York to attend this dinner and to get acquainted with the San Francisco members of the organization. While here, he made a study of the automotive engineering problems of this section of the Pacific coast. W. W. MacDonald, president, and A. A. MacCullum, secretary, of the San Francisco chapter, S. A. E., were in charge of the dinner and the program which went with it. Mayor James Rolph, Jr., was represented by the chief of the city's engineering department. Automobile dealers and the allied industries were represented by a number of the executives of their organization.

Hamey Succeeds Hilbert

C. W. Hadden, general sales manager of Velie Motors Corp., announces the appointment of B. F. Hamey to succeed J. C. Hilbert as district representative in Minneapolis. Hamey, for several years, was prominent in the implement and tractor field, having been connected with Parli-Orendorff Co. as Minneapolis branch manager and later serving the Lacrosse Plow Co. as tractor division manager.

du Pont Handles Taxes

Though his time is now fully occupied as chairman of the board of the General Motors Corporation, chairman of the board of E. I. du Pont de Nemours & Co., and many other similar business enterprises, Pierre S. du Pont of Wilmington, Del., has accepted appointment by Governor Robinson to the office of Delaware State Tax Commissioner. He will have charge of the collection of income and school taxes.

Coming Events

SHOWS

Oct. 8-17—London, Olympia passenger car show.
Oct. 18-31—Salonica, Greece, First International Sample Fair.
Oct. 29-Nov. 7—London, annual truck show.
Nov. 5-21—New York, Automobile Salon.
Nov. 26-Dec. 6—Berlin, Germany, Annual Automobile Show in the Kaiserdamm.
Dec. 7-20—Buenos Aires, 8th Annual Argentine Automobile Show.
Jan. 9-16—New York, N.A.C.C. National Annual Show, Grand Central Palace.

Jan. 16-23—Cincinnati, 16th Annual Auto Show, Cincinnati Automobile Dealers Association, Harry T. Gardner, Manager.

Jan. 30-Feb. 6—Chicago, N.A.C.C. National Annual Show, Coliseum.

Feb. 15-20—Louisville, Ky., Louisville Automobile Show, Armory, under the auspices of the Louisville Automobile Dealers Association, J. Garland Lea, manager.

CONVENTIONS

Oct. 7-10—Montreal, Motor and Accessory Manufacturers Association Convention.

Oct. 20-21—Greensboro, N.C. Annual Convention, N.C. Automotive Service Association.

Oct. 21-23—Cambridge, Mass., American Welding Society.

Oct. 21-23—Boston, Fall Meeting, American Welding Society.

Nov. 16-18—Chicago, National Standard Parts Association, Sherman House Annex.

Nov. 9-14—Chicago, Automotive Equipment Association.

Nov. 9-10—Chicago, Hotel La Salle, National Automobile Chamber of Commerce.

Nov. 10-11—Washington, Motor Truck Industries, Inc.

Nov. 17-19—St. Louis, National Tire Dealers Association.

RACES

Oct. 8-10—New York, Pullitzer Cup Races.

Oct. 10—Baltimore-Washington Speedway, Laurel, Md.

Oct. 11—Charlotte, N.C.

Oct. 12—Salem, N.H.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Nov. 9-10—Chicago, Hotel La Salle.

Nov. 12-13—Philadelphia, Automotive Transportation meeting.

Nov.—Service Engineering meeting.

Bus Most Popular Discussion Topic

Metropolitan Section of S. A. E. Prefers Research as Approach Angle

NEW YORK, Oct. 8—Preference for general topic of discussion and the angle of approaching these topics is shown in the answers to a questionnaire sent to the 546 Metropolitan section members of the Society of Automotive Engineers. Buses was the most popular topic, and a decided preference was shown for approaching all topics through research methods.

Topic preferences followed buses in this order: trucks, engines, automobiles, fuels and lubricants, transmissions, airplanes, traffic and laws, rail cars, steering and electrical apparatus. Research led the preferences for angles of approach as follows: Servicing, selling, operation, technical details, advertising and production.

At the first Fall meeting of the Metropolitan section on Oct. 15, the general topic will be "Speeding Up Traffic, Safely," and the chief speakers so far announced will be: John C. Long, secretary, Traffic Planning Committee, N. A. C. C.; Harold M. Lewis, executive engineer, Regional Plan of New York and its Environs, Russell Sage Foundation; and Major Elihu Church, transportation engineer, Port of New York Authority. The meeting will be held at Hotel Majestic with dinner at 6.30 and the session at 8 o'clock.

HANDY GOVERNOR AND CLEANER

The Handy Governor and its subsidiary, the Handy Cleaner Corp., have increased manufacturing facilities and moved their main plant to 3925 West Fort St., adding 12,000 feet of space to their present factory.

This addition was necessary to take care of the increasing business of Gover-

nor Equipment, principally on Fordson Tractors, and increased production on Handy Air Cleaners, which are also manufactured, and which have been adapted by some of the important car manufacturers.

Sale of National Motors Property

INDIANAPOLIS, Oct. 7—A decree for the sale of real estate and property of the National Motors Corp., successor of the National Motor Vehicle Co., of this city, and other property and companies of the merger in other states, is being prepared and will be submitted to Federal Judge Baltzell in about ten days.

The property consists of the plant of the old National Motor Vehicle Co. Three of the five buildings of this plant are of modern construction, having been built since 1915. The modern portion of this plant comprises about four-fifths of the floor space and the entire location is on the Belt Line Union Railroad. Real estate, buildings and machinery of the plant, were last appraised at about \$600,000, of which \$90,000 was the real estate value. Not long before the merger, this property was carried at a value of about \$1,400,000, exclusive of inventory. It is understood here that some property of the merged National concern in another state has already been sold under court action.

Black and Decker Has New Office

BOSTON, MASS., Oct. 6—Black & Decker Manufacturing Co. announce the removal of their Boston branch office to new and larger quarters at 62 Brookline street. The new steel and concrete building is near the headquarters of several jobbers.

This branch is now in charge of A. D. Geiger, formerly salesman at the Kansas City branch. He succeeds D. G. Caywood, who has been promoted to act as special representative of the company on various types of special work.

British Railroads Wage War on Buses

Four Great Companies Commence Intensive Drive Against Road Transport

LONDON, ENGLAND, Sept. 28 (by mail)—The four great railroad companies of England have commenced an intensive warfare against all forms of passenger road transport, the intention being, through cheap fares and special travel facilities, to regain as large a proportion as possible of the short-distance passenger traffic lost in the last few years to motor buses and coaches.

A start is being made in the North of England, and reductions in fares are announced, effective Oct. 1. Return tickets at single-journey fares will be issued between all towns in Yorkshire and Lancashire in the case of tickets purchased at 10 a.m. on week days and at any time on Sundays; that will bring the fares to a good deal below those of the inter-town buses. If this trial proves to be successful in meeting bus competition, the policy will be extended to other parts of the country.

Dealers Assisted

in Star Sales

NEW YORK, Oct. 7—The general sales department of Durant Motors, Inc., New York City, is making a special effort to assist dealers in the sale of the Star Coupster by sending a Coupster folder to every physician and every reputable manufacturer and wholesale house in the United States east of the Rockies.

At the same time all Star dealers are receiving a letter from Colin Campbell, vice-president of Durant Motors, Inc., asking them to compile lists of physicians, manufacturers and wholesalers and to follow up the folder by calling on them with the Coupster.

AUTOMOTIVE INDUSTRIES

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Philadelphia, Thursday, October 15, 1925

NUMBER 16

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Cuts Averaging 6 Per CentForeign makes, including American, however, increase
an average of 7 per cent, due to import tax.

Most manufacturers have new models

By W. M. Bourdon

(Special Cable to Automotive Industries)

LONDON, Oct. 14—The Olympia Show, which opened here October 8, is notable for the largest number of new models ever exhibited in any year except 1919, the almost general adoption of four wheel brakes on European cars, the number of new British sixes and American eights, and the introduction of glossy cellulose lacquer finishes.

No general departures in engineering practice are indicated, except the continued trend toward four-wheel brakes, the use of six and eight cylinders for engines of over 150 cu. in. displacement and of dual carburetors with separate induction tracts for six cylinder engines.

Price Movements Erratic

Price movements are erratic, however, the majority of British makers have reduced their prices, the average reduction amounting to 6 per cent, in spite of the fact that many have added front brakes to the equipment. Most of the Continental makes have been considerably increased in price, though a few have been reduced. Some American cars have been reduced, but others remained unchanged or have been increased.

Taking all imported cars together, the prices have been increased 7 per cent, which shows that the import duty which went into effect in July has not been added to previous prices in full.

Owing to the recent reimposition of the duty, the whole price situation is somewhat unsettled. Some manufacturers, including Studebaker, announce that their prices are subject to change without notice; Essex announces no change, while the Chrysler six is down 11 per cent. Prices on some of the General Motors productions have been increased since July.

Thirty-five new British models are being exhibited, including twenty-five fours, nine sixes and one eight, the piston displacements ranging from 64 cu. in. in the case of the Humber four, which is built in both a four-

passenger open and a sedan model, to 402 cu. in. in the case of the Bentley overhead camshaft six. The solitary eight cylinder model is a Sunbeam of 294 cu. in. displacement. Ten of the fours have under 100 cu. in. displacement; nine more under 120 cu. in.; and six more under 150 cu. in. One six cylinder car has a displacement of only 106 cu. in., while five have between 120 and 200 cu. in. and two over 200 cu. in.

Of British cars, front brakes are standard on 71 per cent and optional on 71 per cent. Of the cars of all nationalities, 75 per cent come with front brakes as standard equipment. Ninety-seven per cent of the brakes are mechanically operated. There are no British vacuum brakes, but four cars are shown with hydraulic brakes, including two with the Lockheed.

Several new French and Italian cars with engines of 1 liter (61 cu. in.) displacement are shown, prominent among which is the new small Fiat. With one exception all of the new Continental models have engines with overhead valves, but most of these valves are operated by side rods. Nearly all of these engines have less than 2 liters (122 cu. in.) displacement.

Of the thirty-five British models twenty-three have valve-in-head engines, while ten have L-head engines and two have engines of the sleeve valve type. There are only four engines with overhead camshafts among these.

Balloon Tires on Light Cars

Reinforced balloon tires are fitted to 60 per cent of all British models, but on only eight per cent of the cars with over 150 cu. in. displacement. On a few models the steering has been rendered slower, and 15 per cent are now fitted with the cam type of steering gear, as compared with 5 per cent last year.

Wolseley has dropped the 160 cu. in. overhead camshaft four cylinder model, while Sunbeam has added a 3-liter overhead camshaft six and a 5-liter pushrod eight. Rolls-Royce now fits a four-speed right hand

British Exports Growing

IN a speech before the Society of Motor Manufacturers and Traders at the opening of the Ninth Annual Automobile Show, at Olympia, on October 8, Sir William Joynson-Hicks, British Home Secretary, commented on the "unprecedented wave of prosperity which British motor car builders are enjoying at the present time."

As evidence of this prosperity he stated that British automobile exports for 1925 will show an increase of 50 per cent over 1924.

control transmission instead of the three-speed gear with central control on the "Twenty" and is offering front brakes at £85 extra, these being the same servo-assisted brakes as fitted on the 'Forty' as standard equipment. The latter has a new pushrod engine, the side valve type being dropped.

Vauxhall is introducing a Burt single sleeve six cylinder engine of 236 cu. in. displacement. Morris is again concentrating on two fours. In the Lanchester "21" the bore has been increased and the wheelbase lengthened to 133 in. Singer is introducing a new 106 cu. in. six priced at £375. This is an orthodox four door sedan with front wheel brakes. Armstrong-Siddeley is not showing anything new. A Short 156 cu. in. six of 114 in. wheelbase and with front wheel brakes sells at £450 for the open model and £525 for the sedan, and competes with several American sixes.

Morris Gets Competition

Morris is being challenged by certain new British models, notably Hillman and Standard, both of which have a 120 cu. in. fours of 112 in. wheelbase. The Hillman with a four speed gear sells at £295 for the five passenger open model and at £345 for the sedan. The Standard with a three speed gear sells at £275 and £345 for the corresponding models. All have front wheel brakes. The corresponding Morris cars are £260 and £350; they have a three speed gear, a smaller displacement and a shorter wheelbase. The narrower track, smaller Morris of 94 cu. in. with sedan body retails at £235.

Practically all makers offer sedans with chassis above

one liter (61 cu. in.). Weymann type bodies have not increased on small British cars, but the French are showing more of them with variations, the newer examples being notably less rectangular. One has a folding top.

Crossley, Wolseley and Daimler are offering light sedans. Crossley shows a type with a rigid body framework and all fabric panels. In the case of a Wolseley, fabric or aluminum is optional below the belt. Daimler uses aluminum only below the belt.

The price difference between open and sedan models has not been narrowed, the average advance of the sedan over the open type being 28 per cent. There is a marked increase in four door bodies, even with right hand controls. Further improvements have been made in side screen equipments. Several of these screens fold inside the body. Standard on one model has drop celluloid windows. On the Austin Twenty the screens hinge inside the body; on the Humber they pivot into hollow panels, and there are a number of other variations. Some of these disappearing screens are of glass.

The chief British demand is still for 90 to 120 cu. in. fours with open four passenger body, priced at £200 to £350. The Singer 106 cu. in. six, the smallest six cylinder model yet built, may create new demand, but other makers are skeptical and will watch the result. It is an innovation among economy cars.

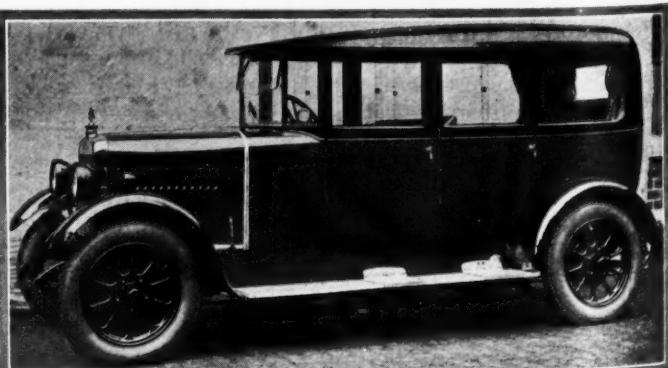
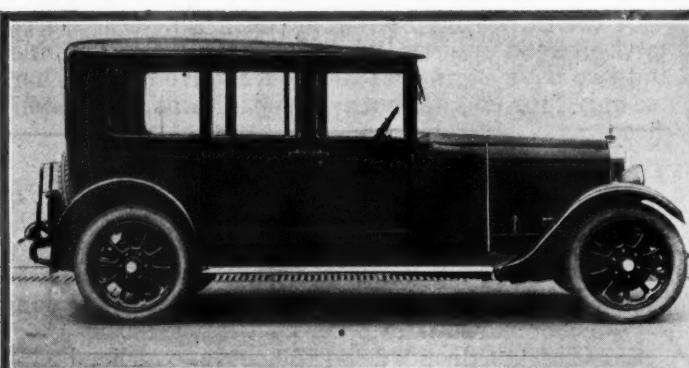
Hotchkiss Has New Four

Among new Continentals are Hotchkiss with a pushrod four of 147 cu. in. displacement, an Itala pushrod six of 122 cu. in. with mechanical servo, an Alfa Romeo overhead camshaft six of 90 cu. in., a Darracq 155 cu. in. pushrod six with four-speed gear optional at extra cost, a Bianchi 80 cu. in. four, an Austrian Steyr with 91 cu. in. overhead crankshaft six, a Fiat 60 cu. in. pushrod four, and a De Dion 80 cu. in. L-head four. These are all high grade cars with front wheel brakes.

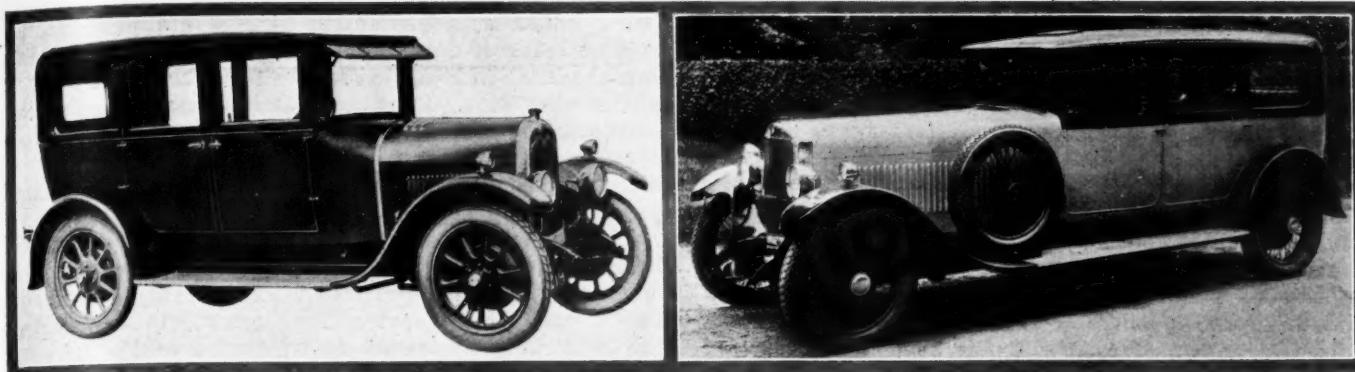
Minerva and Ballot have adopted the Dewandre vacuum brake which is being continued by Voisin. Delage is introducing cast aluminum body framing with sheet panels. The Citroen chassis is unchanged except in details. The price of the 88 cu. in. four has been reduced 15 per cent, while that of the smaller four remains unchanged. Renault and Peugeot are the only other Continental makers announcing price reductions.

Many British makers are showing lacquer-finished cars for the first time in all colors. The majority of them use the glossy finish, and some examples equal the best varnished jobs.

A new process called Celvalac is being tested by many makers and has been adopted by two. It affords a high lustre and it is claimed that the cost is less than that of a dull finish or of varnish. Rover shows two lacquer-



Left—Austin four-door sedan with partition between compartments. Right—Arrol Johnston four-door sedan with novel windshield



Left—Crossley coach with four cylinder 146 cu. in. engine. Right—Eight-cylinder Sunbeam with enclosed limousine body

finished cars, the lustre of which equals that of any car at Olympia. The firm uses its own process and charges extra for this finish.

On the opening day the attendance was 16,000. This is the same as last year, but there were more overseas visitors this time and export trade is promising.

There has been an appreciable increase of business, especially with Australia, New Zealand and South Africa. Home dealers' contracts for small fours are generally bigger. Numerous British makers are planning 10 to 20 per cent increased output and the industry in general is less concerned with foreign competition than hitherto, partly because of the re-establishment of the import duty but mainly because the British type of light car makes the biggest appeal.

27 U. S. Makes Are Shown

Of a total of 121 makes exhibited, 52 are British, 27 American, 25 French, 11 Italian, 3 Belgian, 2 Austrian, and one Swiss. German makers are still barred. There are 522 stands, 111 of which are devoted to cars, 60 to custom bodies, 24 to tires, 310 to accessories, and 17 to miscellaneous exhibits. A total of 580 cars and 78 chassis are shown.

The American makes represented include Buick, Cadillac, Chandler, Chevrolet, Chrysler, Cleveland, Diana, Dodge, Durant, Essex, Flint, Hudson, Hupmobile, Kissel, Locomobile, Marmon, Moon, Oakland, Oldsmobile, Overland, Packard, Paige, Reo, Rollin, Star, Studebaker and Willys. American makes with English representation that are not shown are the Auburn, Gray, Lincoln, Ford and Stanley.

An entirely new six-cylinder 18-50 hp. Crossley has been introduced, the first Six to be made by Crossley Motors, Ltd., and the first overhead valve engine to be produced by this prominent British firm. It has pushrod operated valves, with pressure lubrication for the rocker bearings, and its makers claim unusually quiet operation. The bore and stroke are $2\frac{11}{16} \times 4\frac{3}{4}$ in., giving a piston displacement of 162 cu. in. Both the crankshaft and camshaft have four bearings.

The four-wheel Perrot type brakes are actuated by pedal, without compensation but with individual adjustment. A separate set of rear wheel shoes is operated by the hand lever. Fuel feed is by vacuum, the rear tank having a two-way control cock, enabling a reserve supply of two gallons to be retained for emergency use. The price of the five-passenger open car is 675 pounds, but at Olympia this new model appears as a bare chassis only. The wheelbase is 125 in. and the track 56 in.

A new body model has been added to the existing line, viz., a fabric coach for the 14 hp. four-cylinder (80 x 120

m. m., 146 cu. in.). The framing is comparatively rigid, with morticed and tenoned joints throughout. The panels are built up as follows: A stiff buckram cloth is stretched over the framing, then follow two further layers secured to the first by a waterproof paste, next a layer of canvas is pasted on, while finally the leatherette fabric is secured in a similar way.

The roof construction consists of a series of 1 in. square-section slats forming a lattice-work of 12 in. squares over the whole area; on this a layer of canvas is stretched and between that and the leatherette covering is a layer of wadding about $\frac{1}{4}$ in. thick. The ceiling is of cloth, with horsehair between it and the canvas above. Four 24-in. doors are fitted, with drop windows and mechanical lifts; two fixed windows occur alongside the rear seat and one behind. The windshield is a single plate hinged at the top, and a notable addition for a British car is a sun visor of black leather on a metal framing. Front seats are adjustable.

This model, which is offered at £445 with a choice of two colors, supplements the normal aluminum-paneled sedan, the price of which is £550; for the sake of comparison it may be said that the open five-passenger car is £395, all prices including four-wheel brakes.

The line of three four-cylinder Vauxhall cars has been supplemented by the introduction of a six-cylinder model (81.5 x 124 m. m., approximately 236 cu. in.), with single sleeve valves constructed under the Burt and McCallum patents. In general the valve-operating gear follows normal lines for this valve system, although there are several special detail features. Six transverse eccentric shafts are driven from a longitudinal shaft through skew gears. To balance the thrust on the longitudinal shaft, three of the skew gears are cut with left-hand and the other three with right-hand teeth, the shaft also having a double-thrust ball bearing at the front end. The layshaft runs at crankshaft speed, the necessary 2 to 1 reduction being obtained by the skew gearing.

Ten-Bearing Crankshaft

The crankshaft has ten bearings, this number being arrived at by reason of the central and both end bearings, each being divided into two separate parts. Between the halves of the central bearings is an oil thrower disk lubricating a silent chain drive from the camshaft for the magneto and generator. The front bearing is divided to permit the distribution chain sprocket to have bearings at both sides, while the halves of the rear bearing are separated by an eccentric which operates the oil pump. The crankshaft is a built-up unit, the webs being pressed on to the journals, while each crank web at its outer end is bored, split and V-notched, enabling the separate hardened

steel crank pin to be pressed in and held firmly by pinch bolts. The big-end bearings have floating bronze bushes moving within hardened steel bushes in the split big-end of the connecting rod and also on the crankpin; this construction enables exceedingly narrow big-ends to be used.

The connecting rods are duralumin forgings of H section and the aluminum pistons are of a type now being used by several British makers, known as the B. H. B., in which the split skirt is directly secured to the crown by inclined internal webs around which the sides of the crown hang umbrella-fashion, carrying the rings. This design is said to result in the crown exerting an outward pressure upon the halves of the skirt, so preventing piston slap. The crown of each piston is dished, and the combustion space above resembles a cone with the spark plug at the apex. The result is that when the piston is at the top of its stroke the combustion chamber is pear-shaped; the compression ratio is 5 to 1.

Valve Sleeves of Cast Iron

The valve sleeves are of cast-iron and have four ports, while there are five ports in the cylinder wall, three for induction and two for exhaust. Lubrication is by a plunger pump driven from the crankshaft through an eccentric. The halves of the pump as represented by the two plungers serve both for suction and for delivery into a common lead. Oil is delivered to the hollow layshaft and thence to the main bearings, whence it passes into the hollow crankshaft. The sleeves depend upon splash for lubrication, while the skew gears are located in wells in which a constant oil level is maintained by the surplus from the layshaft bearings. To prevent over-lubrication of the sleeves and cylinder walls and a smoky exhaust, a series of small ports has been cut near the bottom of the cylinder bore, leading the oil back to the interior of the crankcase.

The four-wheel brakes are hydraulically operated, the pedal operating a plunger working in a master cylinder. The brake operating cylinders of the front wheels are located vertically above the pivot pins, each plunger taking effect upon a short transverse lever extending from a left and right-hand threaded shaft, the partial rotation of which spreads a pair of V-ended plungers that expand the actual shoes. The right and left-hand threads are fitted with ball bearings to reduce friction. The hand brake operates on drums within the rear wheels, while the hydraulic system takes effect upon a transmission brake as well as the front wheels.

Six-Cylinder Bentley

Bentley cars have been associated hitherto with four-cylinder high-efficiency overhead camshaft engines alone, but at Olympia a six-cylinder model is shown for the first time; this has a bore and stroke of 100 x 140 m. m. (approximately 402 cu. in.). This new model has an overhead camshaft driven from the rear end by triple eccentric rods reminiscent of the eight-cylinder Leyland. The rods are operated by a short crankshaft mounted above the rear end of the main crankshaft and driven by non-metallic 2.1 gearing. At the rear end of the overhead camshaft is a similar three-throw crankshaft; to allow for unequal expansion the eccentric rods are provided at each end with a pair of flat-sectioned helical springs, which also afford a cushioning effect in the drive. The bearings of the rods are of aluminum and the small crankshafts are case-hardened.

The camshaft drives the water pump at the front end and a generator at the rear, in both cases through a fabric disc point, this arrangement serving to damp out irregularities of the torque due to valve operation. Below the rear end of the camshaft is a cross shaft driving a magneto at each end through a miniature plate clutch

serving also as a torque damper. Four overhead valves per cylinder with concentric springs are provided, the rockers being of duralumin, with hardened steel blocks let into the inner ends and set screws for clearance adjustment at the outer ends. Lubrication is by pressure throughout, a point of note being that, to avoid filling the entire bore of each crankpin with lubricant, each pin contains an aluminum block with a small bore drilled to form an oil passage.

The six cylinders are cast as a block, but have fixed heads. An unusual method is used for supporting the engine. The front end is carried at a single-point on a fabric pad, while the two rear arms are supported on blocks of rubber, being suspended from a yoke with flanged ends which rest upon the rubber blocks. The clutch is of the dry single-plate variety with a duralumin driven disk and fabric facings. At each side of the duralumin disk is a fabric disk, through which the drive is taken to a four-armed star on the clutch shaft; thus a flexible joint is secured between the driven plate and the clutch shaft. The clutch fork has a beam equalizer, while the pilot bearing is a self-aligning ball race. Wire-spoked wheels are standard, chassis lubrication is by oil-gun, the wheelbase is 144 in., track 56 in., and chassis price £1,450.

The Hillman Motor Company, Coventry, which is among the oldest firms in the British industry, and has been very successful for many years past in the production of light cars, has introduced an entirely new model that has aroused interest on account of its unusual performance. It has a four-cylinder 72 x 120 mm. engine (approximately 120 cu. in.), L-head cylinders, three-bearing crankshaft and camshaft and three-point suspension. This engine develops approximately 25 hp. on the brake and rotates at speeds up to 4,000 r.p.m.

Spiral Bevel Gear Drive

The final drive is by spiral bevel gear with a ratio of 4.7, in conjunction with 29 x 4.4 in. balloon tires. Despite this low ratio and small tires, speeds up to 60 m.p.h. are attained on high. The wheelbase is 112 in., the track 52 in., and the ground clearance 9 in. The new Hillman is offered with a five-passenger open body, four-wheel brakes and four-speed gear set at £295.

Besides the five-passenger open car a four-door sedan is standardized at £345.

The Singer four-cylinder 10-26 hp. light cars, which have had an output among the six largest in England, have been supplemented by a six-cylinder model, of which the general design follows closely upon that of the "Four." The new model is known as 14-34 hp. and has a pushrod operated overhead valve engine with a bore and stroke of 63 x 95 m.m. (approximately 108 cu. in.). The cylinder block is cast as a unit with the whole of the crankcase, with the exception of a large sump. The crankshaft runs in three bearings, the cylinders being spaced in two groups of three, with an intervening space between the groups permitting the use of a cored transverse induction passage. Four-wheel braking is standard equipment on this model and also on the 10 hp. "Four" (for the first time in the case of the latter.) The front brakes are of the Rubury type with direct mechanical operation.

The new model is practically the first example of a British six-cylinder "economy" light car produced by a factory of repute; for the present it will be supplied only with a four-door sedan body at £375.

An extremely popular miniature light car during the past two years has been the 8-18 hp. Humber, a high grade "Four" with a bore and stroke of 56 x 100 m.m. (60 cu. in.). It has been supplied with two-seated open and sedan bodies in which "occasional" seating for two children or one adult has been provided behind the main seat.

This model has, however, been enlarged for 1926, to take a "full" four-passenger body, and is now termed 9-20 hp. The engine bore has been increased by 2 m.m., a new cam-shaft for the F-head engine affords increased power development beyond that due to the larger bore, the wheelbase is increased to 102 in. (from 94 in.) the track from 46 to 49, brakes have a larger diameter, half-elliptic springs displace quarter-elliptics, and vacuum fuel feed supersedes gravity. Other modifications result in its being termed a new model.

Three new engines with overhead pushrod-operated valves characterize the line of Star cars for 1926. The new engines are exemplified by the 20-50 hp. six-cylinder model of which the bore and stroke are 75 x 120 m.m. (194 cu. in.).

Dual Concentric Valve Springs

Both crankshaft and camshaft run in seven bearings, the end ones of the camshaft being of bronze and the intermediate of white metal. Dual concentric springs are used for the valves, the latter of cobalt chrome alloy; light tubular pushrods are used and nickel chrome rockers; pivoted rockers are interposed between the cams and followers in the crankcase.

Lubrication is on the splash and pressure system, with troughs under the big-ends and direct leads to the main and camshaft bearings. Camshaft and accessories are driven by helical gears, including a laminated non-metallic wheel on the camshaft.

The front brakes are made under the Lanchester patent in which the expanding cam consists of two flat plates free to turn on the T-ended camshaft, the latter supported by bearings under the axle beam. The wheelbase of this model is 135 in., track 56 in., and tire size (high pressure) 32 x 4½ in. The other two new engines have four cylinders and are constructed on similar lines, the dimensions being 69 x 130 m.m. (119 cu. in.) and 75 x 120 m.m. (120 cu. in.), respectively. The chassis price of the new Six is £650, the five-passenger open car being £775 and the sedan £950.

A firm that has emerged successfully through financial troubles to introduce a new model and adopt a one-model policy is the Alvis Company. The engine is a four-cylinder with overhead, pushrod-operated valves, the bore and stroke being 69 x 110 m.m. (100 cu. in.).

The rear axle casing consists of steel extensions flange-bolted to the ends of tapered tubes of the aluminum centre,

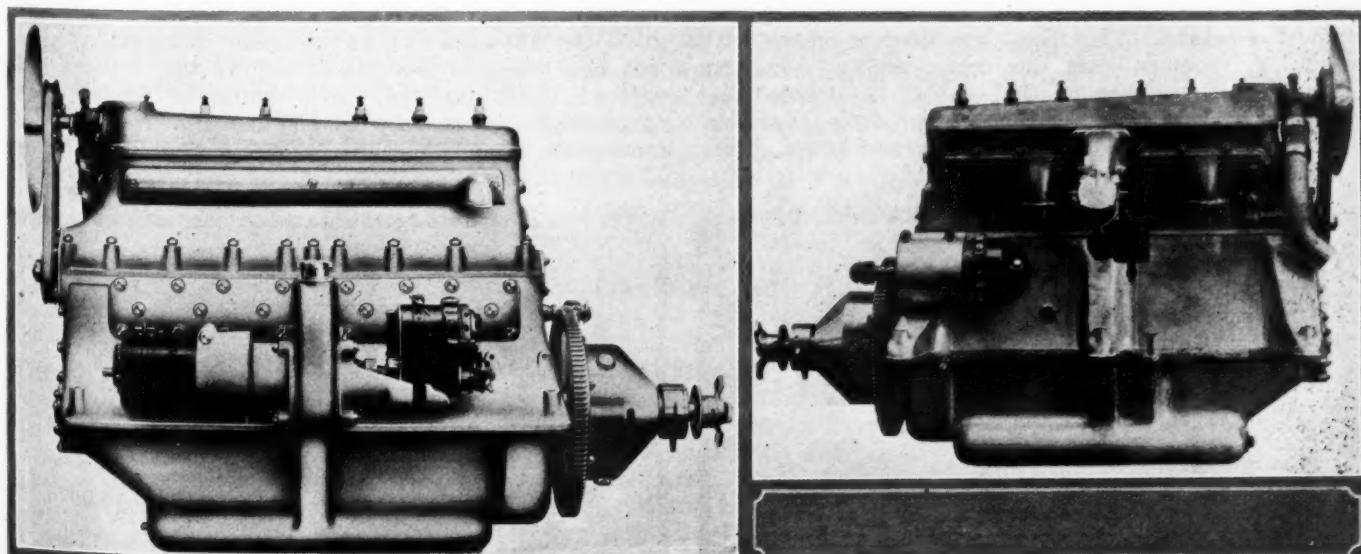
the junction being just inside the spring pads. The front-wheel brakes are of an exclusive design, in which a plunger passing through the steering pivot pin operates toggles that expand the shoes; the latter are of the floating variety, but instead of a floating pivot a spring blade connects them together at their free ends. A centralized single-point adjustment is provided, but there are individual adjustments as well. As a five-passenger open model this car is priced at £495, the sedan being £695.

No mechanical changes of note appear in any of the three Austin models—7, 12 and 20 hp.—but a new sedan body has been adopted for the 20, having fixed front seats and a partition with a large central glass that can be raised or lowered, enabling the interior to be divided into two compartments or used as an ordinary sedan. Two folding seats are attached to the back of the front seat, making the car a seven-seater if required. The rear quarters of the body have a semi-rotund appearance, the back panel being continued over the curved roof edge some 12 in. or so; from there to the front the top has a slight downward slope and is formed of a light framing, padded and covered with leather. Four 24-in. doors are fitted; the double-panel windshield has a hinged top section, while unusually large rectangular ventilators are provided at each side of the cowl. The standard upholstery is cloth and a variety of color finishes is offered, the price being £675. This new model supplements another sedan with adjustable front seats and no partition, price £650.

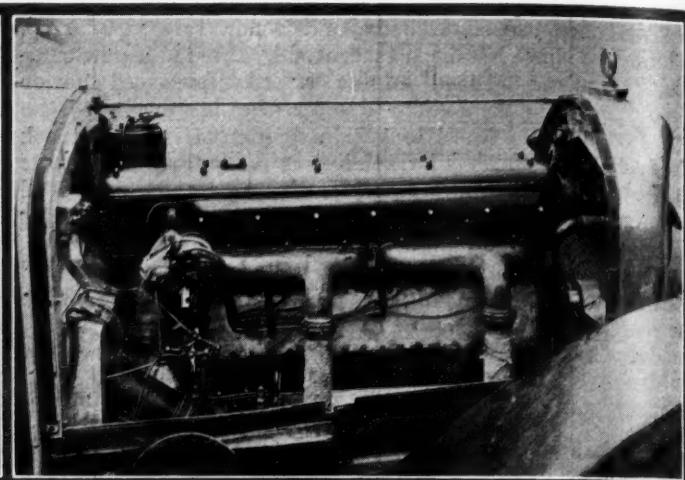
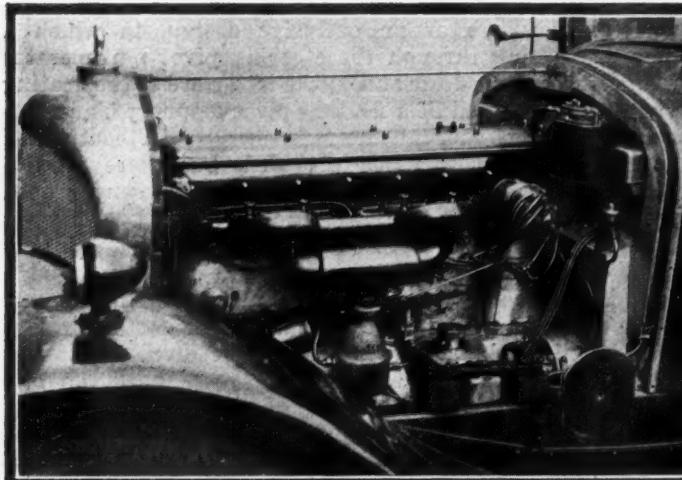
A Straight-Eight Sunbeam

The smallest of the 1925 Sunbeam models, a 97 cu. in. four, has been dropped and a 20-60 hp. straight-eight with engine dimensions of 80 x 120 m.m. (294 cu. in.) has been added. It has pushrod-operated valves, block cylinder casting with one-piece detachable head, nine bearing crank-shaft, single Claudel carburetor, square section water-jacketed induction manifold, hollow crankshaft lubrication and magneto ignition. Helical pinions are used for the distribution, with a bronze camshaft gear. The pistons are of aluminum, with piston pins fixed in the connecting rods. A semi-floating rear axle of the banjo type is used, with spiral bevel drive having a ratio of 4.77 to 1. The rear springs are cantilevers and the front ones half elliptics.

Incorporated with the gear set is a frictional Servo device brought into operation by the brake pedal and actuating the internal brakes on the four wheels; the



Left side of Vauxhall engine, showing enclosed chain drive for generator and magneto. Right—Right side of Vauxhall single sleeve valve six-cylinder engine



Right side of Bentley engine. Note rear support on double rubber blocks. Right—Bentley overhead camshaft engine with triple eccentric camshaft drive

usual hand lever takes effect upon the rear brakes only. The front brakes are of the Perrot type, with self-wrapping shoes. Worm and nut steering, wire wheels and 895 x 135 m.m. Dunlop high-pressure tires are other items of the specification.

Two lengths of wheelbase are to be offered, viz., 137 $\frac{3}{4}$ in. and 147 in., the chassis prices being, respectively, £1,050 and £1,250. The five-passenger open car on the short wheelbase chassis is priced at £1,295, the Weymann sedan on the same chassis, £1,425, and an enclosed limousine or landaulet on the long model, £1,850. All prices include two spare wheels and tires.

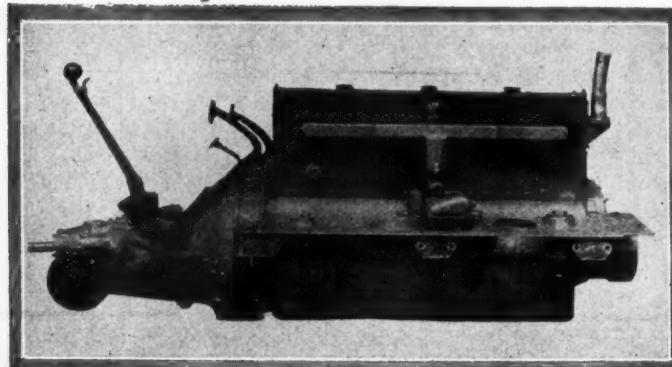
A second model seen for the first time in public is known as the "Three-litre Six" which has a bore and stroke of 75 x 110 m.m. (178 cu. in.) and is a high-efficiency "sports" type, founded on racing practice, with two overhead camshafts driven by a train of helical gears, but only two valves per cylinder. Lubrication is on the dry sump system, with two pumps. The crankshaft runs in 7 bearings. Two carburetors are fitted. Four-wheel braking is included, with self-energizing Perrott shoes. The wheelbase is 130 in.; with a four-passenger open body the price is £1,125; with a Weymann sedan, £1,250.

No changes in chassis design have been made in Morris cars, but the line of standard body types has been added to, one notable addition being a fixed top coupe on the Cowley chassis (94 cu. in.) which is offered at £195 with four-wheel brakes. This body has drop windows with mechanical regulars over the doors, and two quarter lights of half the size of the others. A double-panel windshield is fitted and a two-passenger dickey seat, but only one door is provided, and only one color finish (blue) is available.

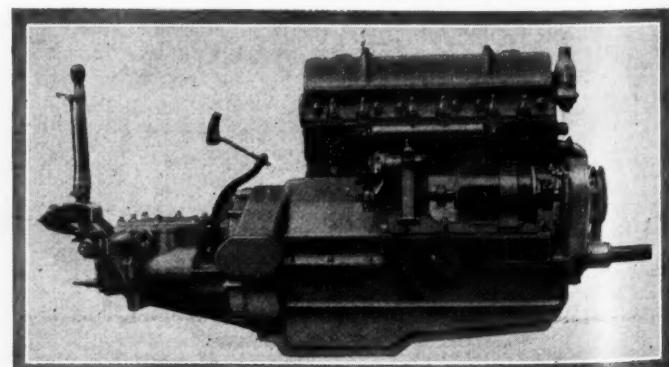
With the Oxford (110 cu. in.) chassis, the body line now includes two folding-top coupes, one with and the other without a quarter light, the prices being £295 and £285. A new sedan on this larger chassis has four doors and six windows, the two quarter lights being fixed; arm-rests and glove boxes combined are provided for the rear passengers, the upholstery is in corded cloth and a choice of four colors is given; the price is £350.

Another new model is the two-door cabriolet or folding top sedan on the Oxford chassis; this is priced at £330 and has four windows running almost the full length of the body sides, all being regulated by mechanical winders. Morris prices again include a full year's free insurance and four-wheel brakes (apart from the open models of the Cowley line, where front brakes are optional at £7 10s extra), the four-passenger being £190 with four-wheel braking. Prices all round show a reduction on those of the 1925 season, despite many additions to the equipment, including dipping headlamp and a thermostatic valve on the Oxfords.

The combined chassis and body of the earlier Lagonda has been discarded in a new and larger model introduced at Olympia the engine of which has an unorthodox feature in the cylinder design. Externally the engine is of Y form transversely, for there are two overhead camshafts widely separated, running in oil wells and located on opposite sides of the cylinder block. This arrangement gives the advantage of an overhead camshaft construction and makes it possible to remove the cylinder head without disturbing the valve timing or breaking any coupling of the camshaft drive it also affords an excellent combustion chamber shape. The bore and stroke are 72 x 120 m.m. (119 cu. in.).



New six-cylinder Crossley engine with side rod operation of valves-in-head. Right—Sunbeam 30/90 hp. eight-cylinder power-plant with four-speed gearset



Just Among Ourselves

Public Convenience

Basis of Parts Distribution

WHILE nearly everybody in the trade realizes mentally that the car owner's convenience and preferences are the final deciding factor in determining distribution channels, a good bit of discussion about distribution goes on that doesn't take that basic fact into account sufficiently. Car manufacturers in discussing what sort of parts their dealers should sell or how parts should be distributed often have based much of their argument on their personal desires rather than upon the needs of the public. But parts will be sold by anybody and everybody who can make it easier, cheaper or more convenient for Mr. Public to buy. That goes for electrical equipment as well as for other kinds of parts. Some electrical equipment men don't like to see the car dealer handling original replacement parts because such practice tends to take business away from authorized service stations. Yet they are frank to admit that the 2500 authorized service stations now in existence can't come anywhere near servicing the 18,000,000 cars in service. Proof that the public will be served lies in the fact that probably 80 per cent of the service parts business on electrical equipment today is going to independent manufacturers of parts made to fit standard units and is being distributed through independent electrical shops and car dealers.

Central Electrical Distributing Centers Suggested

ONE solution suggested recently as regards electrical equipment parts is the establishment by the electrical manufacturers of a central distributor in each territory who would sell only to the trade. He would be the parts reservoir for his terri-

tory and also would handle complete unit repair which would be sent to him by garages and dealers in the territory. Some such plan might fit in better with the merchandising needs of the situation than other methods which have been tried or proposed. In any case, the careful study that distribution problems are getting by electrical equipment makers augers well for constructive development.

Bulbs and Cycles and Such Things

THE current reappearance of bulb horns on a number of cars brings back the days of goggles and linen dusters to those who have been associated with the industry since its inception. Those adherents of the cyclic theory of business and human thought may find in the present trend backing for their ideas. It's a bit hard on the "Lightning Never Strikes Twice in the Same Place" school, however. Wonder if we are to look forward to the doing away with windshields and the reappearance of the ten-man top?

How Noisy is Noisy Noise?

TO hear the long discussions of gear noise and methods of eliminating all kinds of noise in the motor vehicle one might think that automobiles were noisy. Once upon a time they were, but today they really are very quiet, taken as a whole, for after all noisiness is just relative. Compared with what the street car people have done toward eliminating noise in the last quarter of a century, the automotive engineer is a magician. Passenger cars once kept people awake nights with their chugging and snorting, but today one may sleep peacefully without ever knowing how many

hundreds of cars pass by his window in the night. Try and do it with a lot of trolley cars going past! Try to hold a conference in a room situated beside a trolley line and see how many shattered nervous systems accrue before the end of a few hours. Reasons for trolley car noise are easily explained, to be sure, but the mere presence of that noise is getting to be one important factor in bus-street car competition. In that respect the buses have won by many miles. Now trucks—but we'd rather not discuss trucks in this connection right now.

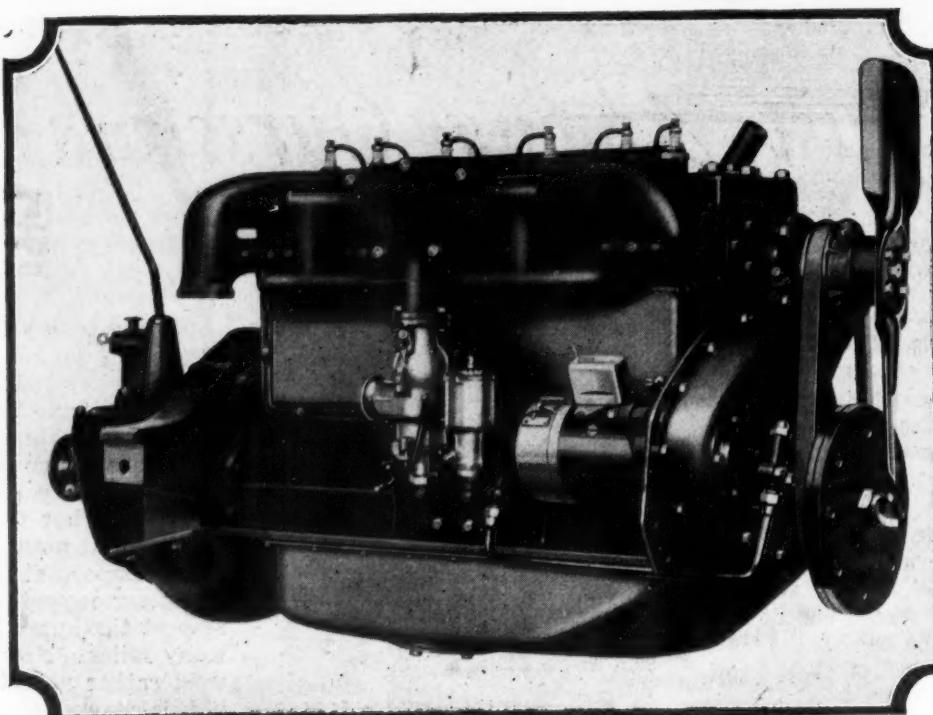
Peaceful Penetration of the Motor Bus

STUDENTS of history are familiar with the way in which conquering peoples often have been absorbed and brought to the habits and customs of the nations which they have conquered through living and working with them. Something of the same kind has happened in the case of the electric railways and the motor buses.

M. & A. M. A.—A. E. A. Merger and Credit Work

IT'S our guess that the desirability or non-desirability of the M. & A. M. A.-A. E. A. merger rests, in the minds of many M. & A. M. A. members, chiefly upon the question as to whether or not the present M. & A. M. A. credit work can be carried on with as great efficiency under the proposed plan as under the present one. Those favoring the merger believe that it can; others have their doubts. But necessity for preserving at its present high peak of usefulness this valuable service is agreed by all. Majority decision as regards this point seems likely to be the determining factor in the minds of a good many of the manufacturers' minds.—N. G. S.

Valve side of the new Hupp Six engine, showing unusual manifold arrangement. Note also accessible location of oil pump.



HUPP Brings Out a SIX

Newly designed, medium-sized car will be offered in two models at \$1,225 and \$1,285

SENSING the demand for a popular priced six-cylinder car, the Hupp Motor Car Company which heretofore has manufactured a four and a vertical eight, has added a medium sized six to its line.

The new model will be furnished in two body styles, a sedan at \$1,285 and a touring car at \$1,225. It has a wheelbase of 114 in. and is equipped with an L-head engine of 3 1/8 in. bore and 4 1/4 in. stroke.

The weight of the closed car fully equipped is 2,800 lb. and that of the phaeton 2,620 lb. Balloon tires, 30 by 5.25

in., and four wheel brakes are featured as standard equipment. Bendix three-shoe, self-energizing brakes are fitted at the front and are applied simultaneously with the rear wheel band brakes of conventional design.

Except for the number of cylinders and the braking equipment, the latest Hupmobile may be considered a smaller edition of the higher priced model. The same principles of design are apparent throughout and materials and inspection standards are identical with those employed in the manufacture of the eight.

Some of the Features of the New Hupp Six

Piston displacement, 195.6 cu. in.

Weight, sedan, fully equipped, 2,800 lbs.; phaeton, 2,620 lbs.

Wheelbase, 114 in.

Balloon tires, 30 by 5.25.

Mechanical four-wheel brakes (self-energizing on front wheel).

Four-point engine support.

Lanchester vibration dampener.

Connecting rods machined all over.

Four-bearing crankshaft.

Silent chain camshaft drive.

Novel arrangement of accessories' drive shaft.

Semi-automatic spark control.

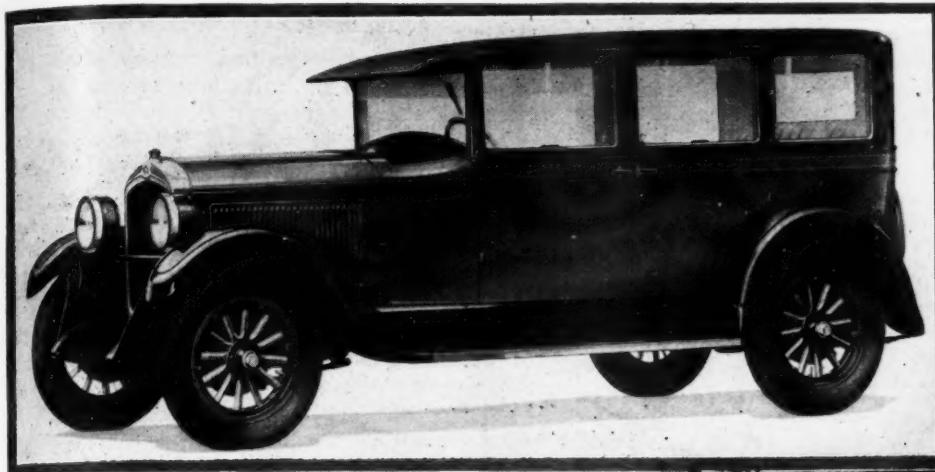
Water pump and fan on same shaft.

Pump shaft of non-rusting, stainless iron.

Four tubular cross members in frame.

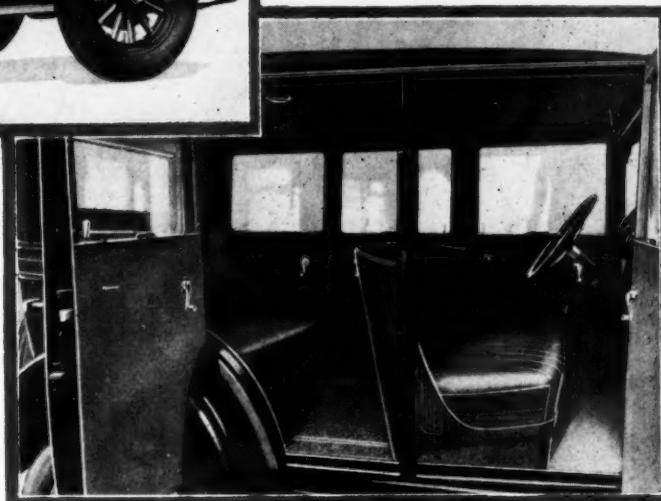
Novel spring shackle design, eliminating noise.

Prices: Sedan, \$1,285; phaeton, \$1,225.



The Hupp Six sedan has the characteristic Hupmobile appearance except that the radiator outline is higher and narrower than on previous models

Below—Interior of the sedan, upholstered in gray brougham cloth. The extra wide doors are a feature



While the new engine has a piston displacement of only 195.6 cu. in. it delivers in excess of 50 hp. at 3,000 r.p.m. Installed at an angle, the unit power plant provides a straight line drive to the rear axle, thereby reducing the frictional losses at the universal points.

Cylinders and Crankcase One Piece

Cylinders and crankcase are a single casting, the head being separate. Four boring and two honing operations ensure exceptional smoothness in the cylinder bore, which is held to a .002 in variation in diameter. The combustion chamber is of the high compression type and is entirely machine-finished. Each cylinder is completely surrounded with cooling water, the jacket extending down to the end of the stroke. One of the unusual features is the capacity of the side water chambers which have a removable cover running the full length of the block. From the centrifugal pump, water is forced into the large side chambers, whence it is distributed around the cylinders. Extra large holes on the valve side permit a rapid flow of water at this point, smaller holes being used on the opposite side. The radiator is of the cellular type and cradle-mounted to protect it against strains due to weaving. The water capacity of the entire system is 3 1/4 gals.

The crankcase, which is supported at four points, is designed for rigidity and accessibility, and the pistons and connecting rods can be withdrawn through the bottom without disturbing any other part of the engine. There are four main bearings which have their caps recessed into the case. These bearings are of the bronze-back, babbitt-lined type and have the following dimensions (front to rear):

2 11/32 x 1 5/8, 2 23/64 x 1 1/4, 2 3/8 x 1 1/4 and 2 25/64 x 2 1/8 in.

All bearing caps are provided with brass shims and are held by chrome nickel steel studs which are locked in position after recesses are machined in the crankcase casting. The bearings are bonded to the connecting rods by a special spinning process and are machined and broached before being hand-fitted to the crankshaft. The connecting rod bearings measure 2 1/8 in. by 1 17/64 in.

Lanchester Dampener Used

A Lanchester vibration dampener similar to that adopted for the eight-in-line engine a few months ago is mounted on the front end of the crankshaft and forms part of the fan drive pulley. At the opposite end of the engine a semi-steel flywheel is secured to the crankshaft flange by four bolts.

The crankshaft itself is of massive construction, weigh-

ing 64 1/2 lbs. Thrust is taken by the flanged front bearing, shims being provided to take up shaft end play. The rear of the crankshaft is machined to receive a steel roller bearing and bearing shell which supports the front end of the clutch gear shaft.

Connecting Rods Machined All Over

The carbon steel connecting rods are machined all over and have a center-to-center length of 8 3/4 in. Bolts of 3/8 in. diameter secure the caps. All rods are weighed and arranged in groups of six, with a variation in weight of not over .01 lb. The hollow, hardened piston pins are clamped to the rods and provide a bearing surface 1 9/16 in. long. It is claimed that greater life is obtained with the steel pins bearing directly against the cast iron pistons than with the more usual arrangement involving the use of bronze bushings. The piston pins, which are hardened, ground and polished, are of the same diameter as those in the four cylinder model (7/8 in.).

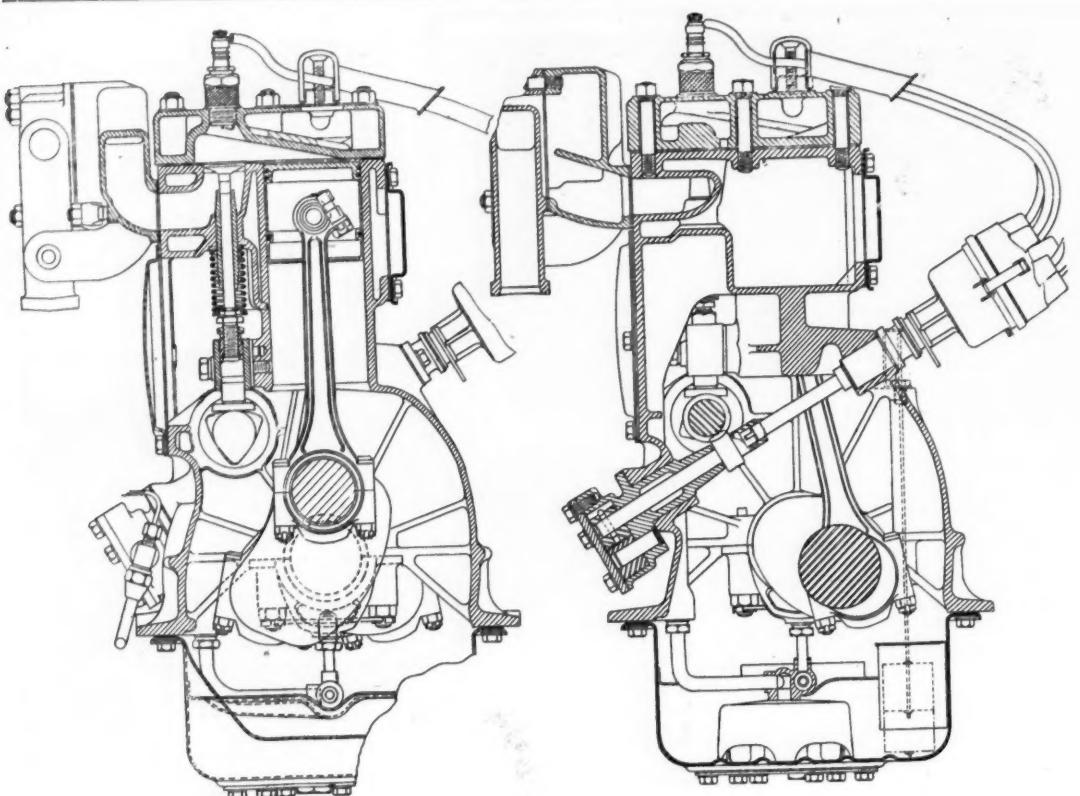
The grey iron pistons are cast in metal moulds; they weigh 19 ozs. and are 3 1/8 in. long. Two 1/8 in. rings are fitted above the pin and one oil scraping ring, 3/16 in. wide, below. The weight of a complete set of reciprocating parts, including the connecting rod, is 48 ozs.

A Morse silent chain, 1 1/4 in. wide, drives the camshaft and generator, the latter being pivot mounted and provided with a screw and lock nut, making for easy adjustment of the timing chain. The camshaft is a 15-25-point carbon steel forging, carried on the right side of the engine, the same as the generator. Four large removable phosphor bronze bearings of the following dimensions carry the shaft (which has its thrust taken by a special plunger and spring at the front end):

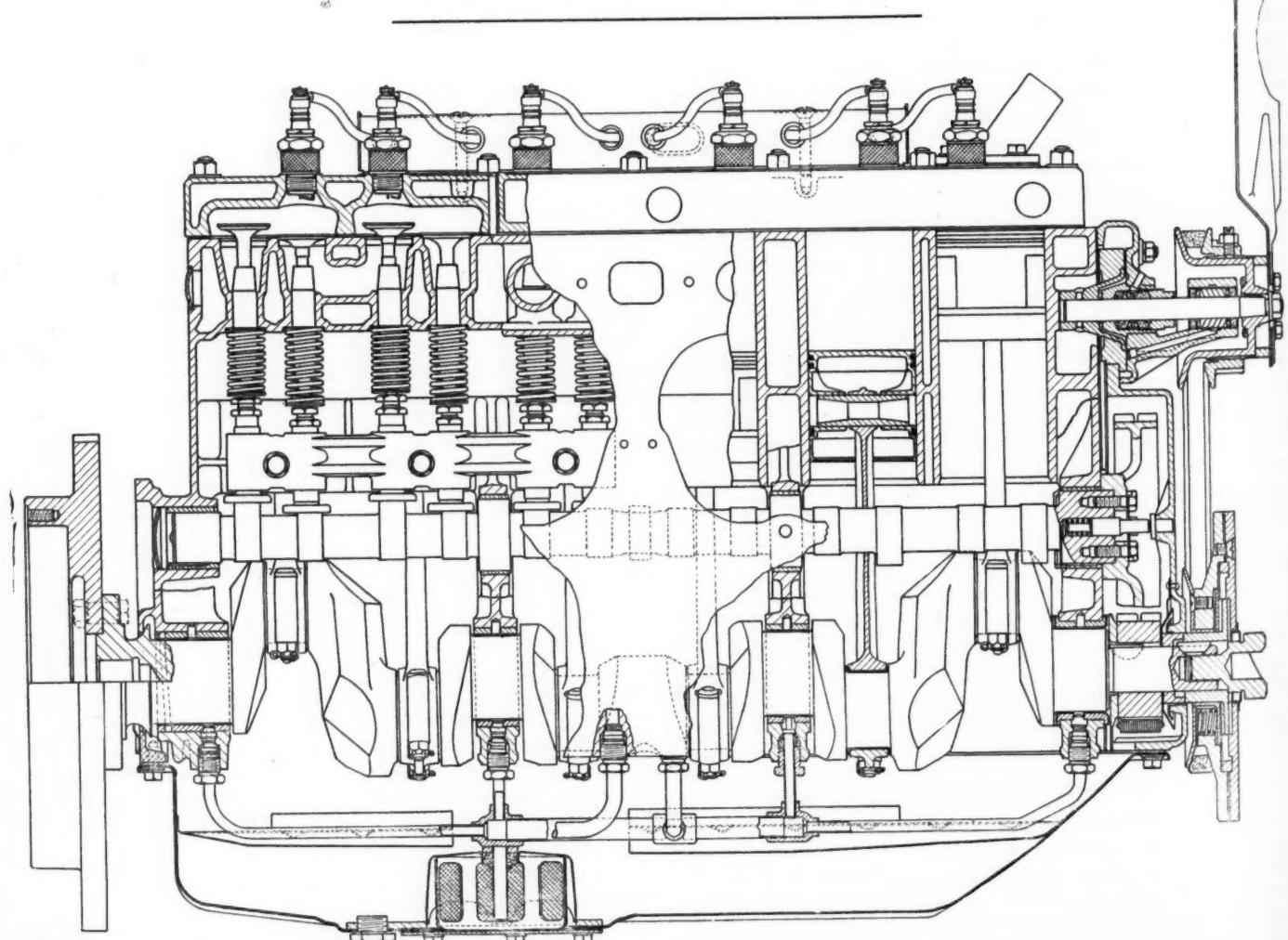
Front, 2 3/32 x 1 3/8 in. Third 2 1/16 x 7/8 in.

Second, 2 5/64 x 7/8 in. Rear 1 1/2 x 1 1/2 in.

The mushroom type valve lifters have a base of chilled iron and a steel stem of 7/8 in. diameter, the two being electrically welded. By the removal of three cap screws,



Left—Cross section through cylinder, showing heavy ribbing of crankcase. Right—Cross section of engine between cylinders, showing novel accessories drive



Longitudinal section through Hupp six cylinder engine

it is possible to detach one of the two valve cluster assemblies. This operation, of course, follows the removal of the valve covers. Both inlet and exhaust valves have a $1\frac{1}{8}$ in. clear diameter and a lift of $5/16$ in. In the case of the inlet valves, cast iron heads are jointed to steel stems, while the exhaust valve is made in one piece of special alloy steel. The springs are of oil-tempered chrome vanadium steel and exerting a pressure of 58 lbs.

One of the unusual features of the new six engine is the drive for the oil pump and the ignition distributor, the former being located high up on the right side of the engine and the latter lower down on the left. The shaft actuating these two units, while driven from the center of the camshaft by helical gears, is inclined about 30 deg. to the center plane of the engine. Being mounted at the ends of this accessories shaft, the two units are most accessible and the pump driving gear clearance can be adjusted from the outside of the engine.

Engine lubrication is by the conventional pressure system to the connecting rod journals. Cylinder walls, piston pins, valve mechanism and camshaft bearings are lubricated by oil spray. The pump being mounted at an angle, a supply of oil is maintained in it at all times. A larger strainer, which can be removed quickly for cleaning through a hole in the pressed steel oil pan, completely surrounds the inlet opening. The oil pressure relief valve is located on the timing chain cover and its overflow lubricates the front end drive. A float type oil level gage on the left side of the engine is graduated to show 8 quarts of oil when the crankcase is filled to the normal level.

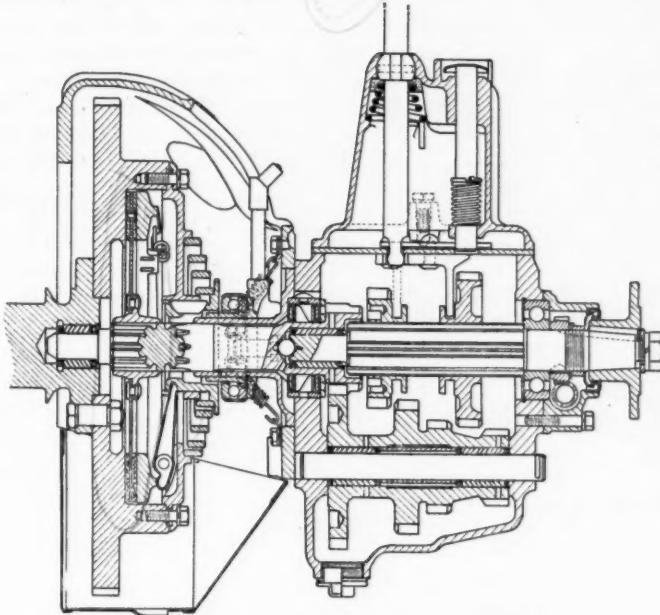
The Stewart carburetor is fed with fuel from a 15 gal. tank located at the rear by a vacuum tank. A supply gage operating on the hydrostatic principle is built into the tank. Its dial is conveniently located on the dash. The design of the manifolds is somewhat unusual and has contributed to a large extent to the smooth running of the new six, it is claimed. The intake manifold leads directly from the carburetor to the hot spot on the exhaust. After the gas is volatilized at this point, it is delivered to large size distributing passages having abrupt square corners.

Autolite Electrical Equipment

All of the three chief items of the electrical equipment—generator, starter and distributor—are of Autolite make. As previously mentioned, the generator is driven by the timing chain while the starter is mounted in the clutch housing on the left side. Engagement with the flywheel gear is through Bendix drive of the outboard type. The battery is a Willard 6 volt, 120 amp. hour, and is carried in the frame.

Spark control is semi-automatic and stops limit the advance and retard motion. The hand spark lever turns through a small arc at the top of the steering post. Besides being very accessible, the distributor is well protected from mud and water that may enter through the radiator. The coil is equally well protected on the front of the dash. Metal conduit protects the high tension cables running to the Champion spark plugs. The firing order is 1-5-3-6-2-4.

Forming a unit with the fan, the water pump assembly is attached to the front of the cylinder block by cap screws. The shaft carrying the impeller at the rear and the fan at the forward end, is of stainless iron and its rear bearing is lubricated by the Alemite system. On the forward end the fan is carried on a special Hyatt roller bearing, this also being Alemite-lubricated. The impeller and the two-bladed fan are so designed that their thrusts equalize one another at all speeds. Two metallic



Hupp Six clutch and transmission

packings, with an oil distributing ring between them, are held in place by an ordinary packing nut. The entire unit is driven by a V belt which is adjusted by means of a movable flange on the fan drive housing.

Integral with the engine are the clutch and gearset. The clutch is of the single dry disk type, 9 in. in diameter, the driven member being faced on both sides with woven asbestos lining. The single spring exerts a pressure in excess of 200 lbs. Hyatt roller bearings support the clutch shaft at both ends.

In the selective type of transmission three speeds of the following ratios are provided:

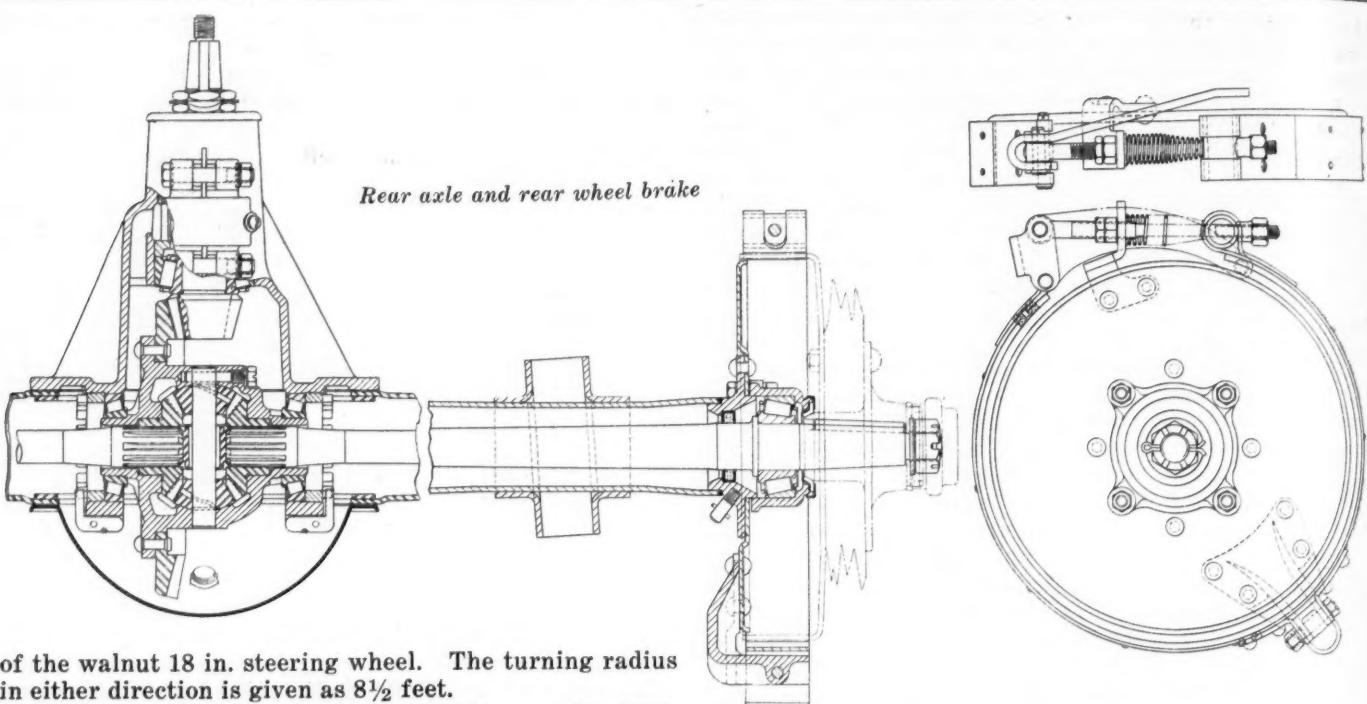
Low	3.24 to 1
Second	1.71 to 1
Third	1.00 to 1
Reverse	4.15 to 1

High carbon chrome steel is employed for the gears in which the teeth are given a burnish finish. The sliding gear shaft is a six-splined forging of $3\frac{1}{2}$ per cent nickel steel and is supported at the forward end in a roller bearing and at the rear in a radial ball bearing. The countershaft rotates on two Hyatt bearings on a stationary spindle. An approved lock is built into the housing.

Connection is made with the rear axle by a 2 in. tubular propeller shaft carrying an oil-tight metal universal joint at either end. The rear axle is a spiral bevel, semi-floating design employing the Hotchkiss form of drive, and providing a standard gear reduction ratio of 4.9. A pressed steel housing of the banjo type is employed and has the differential carrier assembly bolted to it. After the two high carbon chrome nickel steel axle shafts have been withdrawn, the differential assembly is detachable as a unit. All of the gears of both the drive and the differential are made of $3\frac{1}{2}$ per cent nickel steel. Integrally formed, the drive pinion and shaft have an overhung mounting on two adjustable taper roller bearings. The drop forged wheel hubs are keyed to the tapered axle shafts.

Spring bed plates on the I-beam 35-45 point carbon steel front axle are forged flat. Steering knuckle thrust load is taken on bronze and steel thrust bearings. Steering knuckles and arms are forged of chrome nickel steel. Rebound snubbers are supplied at the front axle only.

The Ross cam and lever type steering gear is employed and permits a 60 deg. total movement of the front wheels, corresponding to two and one-half complete revolutions



of the walnut 18 in. steering wheel. The turning radius in either direction is given as $8\frac{1}{2}$ feet.

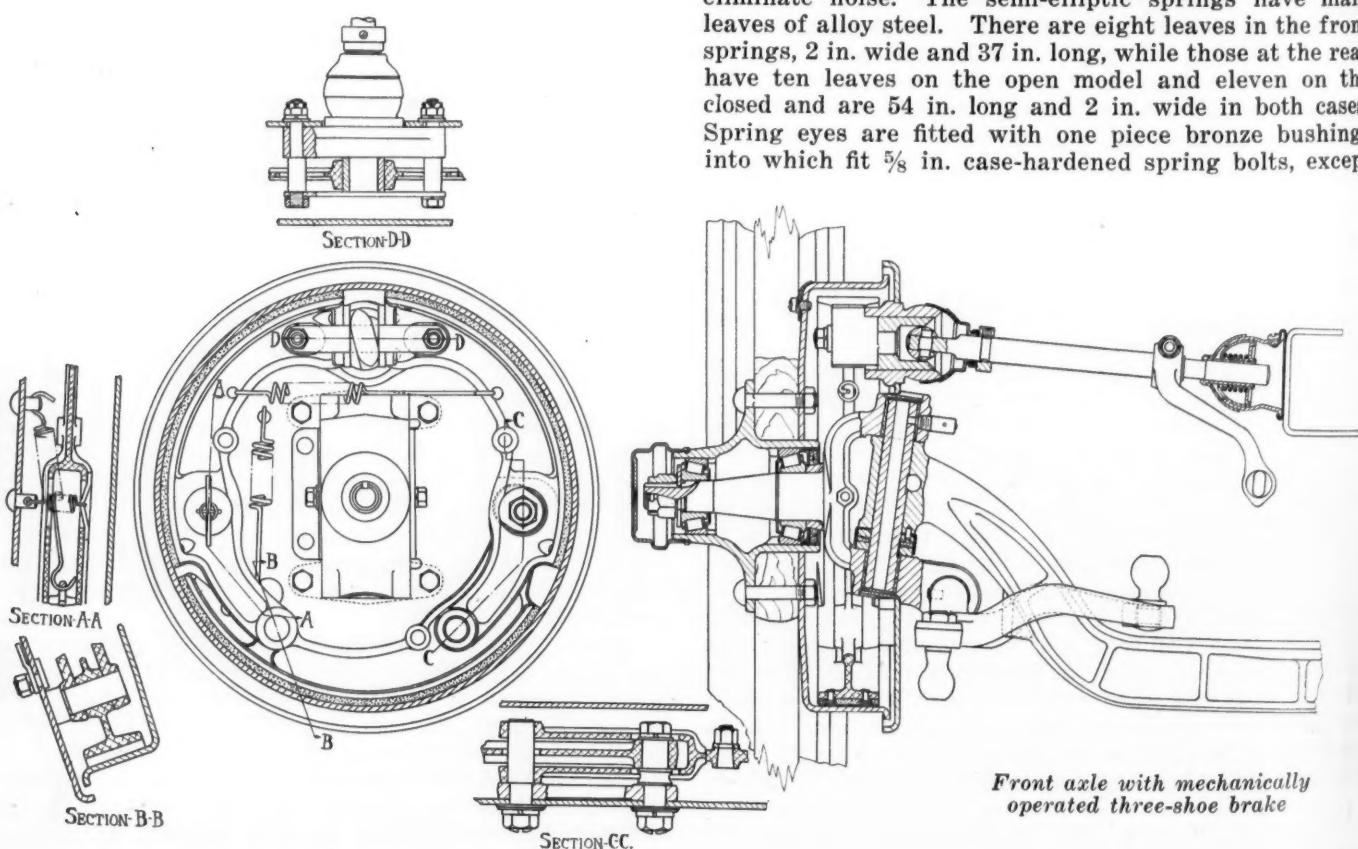
The three shoes of the Bendix brakes on the front wheels are quickly replaceable and the shoes can easily be adjusted by the simple outside adjustment nut, with observation through an inspection hole in the brake housing. After the drums have been assembled on the wheels, they are machined on the inside to ensure concentric braking surfaces.

Both rear and front brakes are actuated simultaneously by the brake pedal. An equalizer is located immediately behind the center tubular frame member. To obtain more room in the driver's compartment and at the same time simplify the brake linkage, the hand or parking brake lever is supported on the left side bar of the frame

and operates independently the same set of rear wheel brakes that are operated by the pedal in service braking.

The straight, tapered frame with channel side members of $5/32$ in. stock, 5 in. deep and with $1\frac{3}{4}$ in flanges, is fitted with four tubular cross members and one channel member, the rear engine support acting as an additional brace. Metal running boards covered with corrugated rubber are employed.

Spring shackles of new design are used, consisting of drop-forged threaded links and a series of laminated steel leaves. This type of shackle requires no adjustment, maintains the correct tension at all times and tends to eliminate noise. The semi-elliptic springs have main leaves of alloy steel. There are eight leaves in the front springs, 2 in. wide and 37 in. long, while those at the rear have ten leaves on the open model and eleven on the closed and are 54 in. long and 2 in. wide in both cases. Spring eyes are fitted with one piece bronze bushings into which fit $\frac{5}{8}$ in. case-hardened spring bolts, except



Front axle with mechanically operated three-shoe brake

at the front of the rear springs where a $\frac{3}{4}$ in. bolt is used. Chassis lubrication is provided for by 25 Alemite fittings. Twelve-spoke natural finish artillery wheels, together with straight side one piece demountable Kelsey rims, are standard equipment. The road clearance is 9 in. with the standard 30 by 5.25 in. tires.

Both body models are built by Murray, are of composite construction and finished in Duco. The doors are extra wide, those at the rear being 27 in. across and the front 23 $\frac{1}{2}$ in. in both models. A new olive green color combination is adopted for both models and is relieved by a fine line of striping in a contrasting shade. The sedan is upholstered in gray brougham cloth and is fitted with a one-piece vision-ventilating windshield.

Cowl Ventilator on Touring

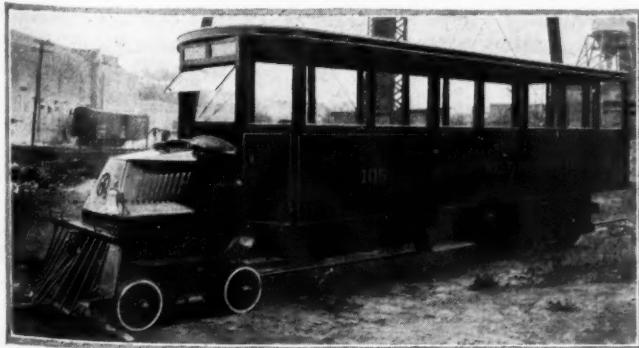
The touring model also carries a one-piece windshield and swings from the top of the side posts. In addition a cowl ventilator is provided. A gray mottled upholstery of genuine leather is employed on the open car. The side curtains of the folding top are stored in a compartment behind the front seat. The lines of both bodies are improved by a strip of moulding extending from the radiator entirely around the body, forming on the closed model the popular double belt effect.

While of characteristic Hupmobile shape, the radiator, with nickel-plated shell, is of higher and narrower design and has its appearance enhanced by fluting on the side nearest the core. A tie bar upon which are mounted the interchangeable, nickel-plated, barrel-type headlights serves as an additional brace for the front fenders and provides a means for carrying the license plate. Headlight bulbs of 21 c.p., dimmed by a resistance coil, are furnished. All lighting circuits and that of the horn are protected by a 25-ampere fuse.

Non-glare lenses and a combination tail and stop light are fitted. The instruments are enclosed by octagon shape frames and are grouped symmetrically on the walnut-finish instrument panel. At night the flush-set instruments are illuminated by a hooded light of unusual design. Other items included in the standard equipment are an automatic windshield wiper, rear view mirror, dash gasoline gage, and transmission lock.

A Special Rail Motor Car

A GASOLINE engine driven rail car accommodating from 12 to 15 passengers on 200 to 3,500-mile inspection trips of railroad properties, has been built by Fitzgibbon Crisp, Trenton, N. J., on a Mack rail car chassis. The single model built thus far is for the use of a Western Union Telegraph official for inspecting lines which parallel railroads. To make this inspection easy,



Rail motor car built for Western Union Co.

windows 36 in. high were used, involving the design and construction of special regulating devices.

The body is equipped with leather upholstered seats for 20 passengers, two luggage compartments, two folding tables for blue prints, etc., a lavatory and buzzer system. Interior paneling is walnut, ceiling is white, frame is ash and exterior panels are of heavy sheet steel. Floor is covered with linoleum, windows are encased in brass sash and entrance is obtained through an enclosed step with spring trap of regular railroad pattern.

Mechanical details include Westinghouse straight air brake equipment, A. C. truck transmission, 12-volt electric system, Splitdorf dual ignition, Hyatt roller journal bearings, Ingersoll-Rand air compressor and sander. Transmission provides forward or reverse, and a speed of 55 m.p.h. is attainable. Finish is Brewster green with gold leaf lettering.

Trailer for Shop Inspections



Factory Inspection Trailer

TO facilitate plant inspections by works managers and other factory executives the Mercury Mfg. Co., of Chicago, has designed the passenger trailer shown in the accompanying illustration. The vehicle accommodates four passengers and may be attached to any ordinary industrial truck or to another trailer for transportation to any part of the plant.

African Car Dealer Adds Motor Boats

THE creation of a number of large dams in various parts of South Africa has led to an increase in the sport of motor boating. A few of these irrigation projects are situated near the larger towns, and thus people are making use of the expanses of water which are quite a novelty in this dry sub-continent. There are no really navigable rivers, and no natural lakes worthy of the name south of the equator. Some of the new irrigation dams cover large areas, and are situated in beautiful country.

Motor boating is on the increase, notably near Johannesburg, where the waters of the Vaal River, recently dammed up, and the new Hartebeestpoort lake attract city men for day or week-end outings. Motor traders have had inquiries for moderate-sized motor launches and for out-board motors. In regard to the latter, it is interesting to know that a well-known motor firm, Messrs. Williams, Hunt & Co., Ltd., distributors for Chevrolet cars, is entering the boat engine field.

THE results of the Pulitzer Air Races at Mitchel Field, L. I., Monday, Oct. 12, are fully covered in the news pages of this issue. Next week readers of *Automotive Industries* will get an analytical story of the event, describing the main characteristics of the competing planes and telling what the races revealed in the way of aeronautic progress and development.

C. M. Keys Says U.S. Air Officials Know Little About Aviation

Head of Curtiss Co. criticizes Army and Navy flying chiefs in presence of Maj. Gen. Patrick at S. A. E. Aeronautic Meeting. All phases of airplane construction and operation discussed

By Leslie S. Gillette

EXCEPT for "a very general smattering of incomplete knowledge, based upon hearsay," the U. S. Army Air Service knows nothing about aviation, declared C. M. Keys, president of the Curtiss Aeroplane & Motor Co., in an address at the dinner which was a part of the Aeronautic Meeting held by the Society of Automotive Engineers in the Hotel Astor, New York, on October 7, the day before the start of the International Air Races at Mitchel Field, L. I.

Mr. Keys' statement was all the more striking in view of the fact that it was made in the presence of Major-General Mason M. Patrick, chief of the Army Air Service.

The airplane builder said that he was voicing an opinion about air service conditions as formed by direct contact with government air officials at Washington. While he praised their technical activities, he stated that their lack of knowledge of aviation was in marked contrast with their expertise in other lines of naval and military knowledge.

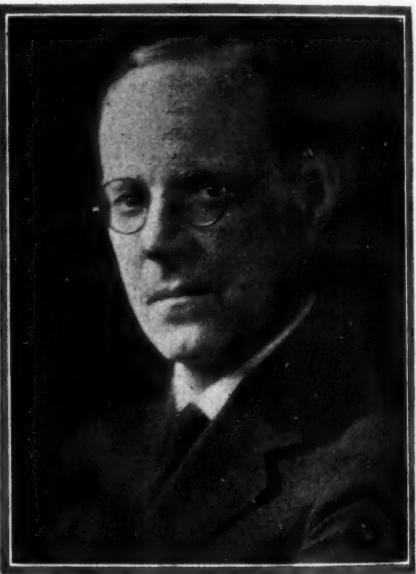
One of the most astounding statements from one of the air officials at Washington, Mr. Keys said, was that the N. C-4 flying boat, which flew across the Atlantic and was built about seven years ago is regarded today as the best machine ever built and designed by the naval department. It is well known that the N. C-4 was a Curtiss product from start to finish and its design is regarded everywhere as being totally obsolete.

An Unfair Comparison

In the controversies which have arisen during recent years on the value of the airplane as compared with the battle ship, the speaker pointed out that investigation boards are at the present time making comparisons of the relative value of the airplane against that of the warship. In this connection, the navy is basing its observations on the famous twin-engined Martin bomber, which, although built over seven years ago, is still used extensively in the service. The progress made in airplane design and development during the past seven years has been so rapid that the performance of the Martin bombers, as compared with a present-day machine, may be likened to the performance and utility of an old wooden frigate when matched against the modern battleship, he said.

Mr. Keys said that prior to the boom which occurred in

C. M. Keys, president, Curtiss Aeroplane & Motor Co., principal speaker at S. A. E. Aeronautic Banquet.



commercial aviation centers last winter, he was ready to quit the airplane business for good, but he is glad now to say that he has taken off his coat and got into stride again in developing and promoting the best and most reliable types of airplanes.

Latest information on airplane design, construction and operation was presented in a number of addresses before important American and foreign aeronautic authorities who attended the meeting, which proved the most enthusiastic and interesting of all S.A.E. aeronautical gatherings which have been held, not only because of the number of those present and the many prominent persons attending, but because every interesting phase of aircraft discussion was covered by the various papers.

The meeting was divided into afternoon and evening sessions, with the banquet taking place at 6 o'clock.

Besides attending the banquet, P. E. Flandin, president of the Aero Club of France, and Louis Breguet, prominent French airplane manufacturer, were present at the meetings, which commenced at 1:30 P. M. The afternoon meeting was designated as the "Design and Construction Session," with four papers being read before a gathering of guests and members in excess of 350.

After the reading of all the papers, lively discussions took place, which proved to be, as is very often the case, of even greater interest than the papers themselves. Several speakers illustrated their papers by means of motion pictures and lantern slides, enabling the features in discussion to be observed more thoroughly.

Henry M. Crane, General Motors Co., past president of the society and acting as toastmaster at the banquet, presented the first paper, entitled "The Aeronautical Safety Code, Its Object and Meaning." As the code has only recently been completed after five years in course of preparation, it proved to be of exceptional interest to the members. Mr. Crane, who has been chairman of the committee in charge of the undertaking, explained the object and meaning of the Safety Code as it finds practical application.

How Racing Planes Are Built

"The Evolution of the Racing Plane," a paper by W. L. Gilmore, Curtiss Airplane & Motor Co., was read by Mr. Keys in the absence of Mr. Gilmore, who was engaged in preparing the latest Curtiss racers for the Pulitzer Races. Various steps in the evolution of the racing plane, as well as a brief history of the Curtiss racers, were covered in the paper.

George J. Mead, Pratt & Whitney Aircraft Co., discussed the development of aircraft engines in general, reporting in detail his observations with regards to the development of air-cooled engines. The air-cooled engine situation was explained in Mr. Mead's paper, entitled "Some Aspects of Aircraft Engine Development."

The remaining speaker of the afternoon session was W. Laurence Le Page, Gardner Publishing Co., who read an excellent short paper on "The Light Airplane and Low-Powered Flying." In his paper important factors involved in the design and construction of light airplanes were analyzed. In addition, consideration was given to the possibilities of utilizing man power in flying.

Three papers comprised the "Operation" or evening session, which drew a considerably greater attendance than the previous meeting. Perhaps the most interesting paper of the meeting was delivered by William B. Stout of the Stout Metal Airplane Co., Air Line Division, Ford Motor Co., on "Operation Lessons from the Ford Lines." He went into the lessons that have been learned from the intensely practical experiments of the Ford Motor Co.

"Reliability in Operation" was the title of the paper presented by J. Parker Van Zandt, Department of Commerce. Having devoted several years' time to the study of operations on American and European air lines, the report of his findings showed the importance of reliability in operation of aircraft.

Air Mail Facts and Figures

At the time when several concerns are contemplating entering the commercial airplane field, the important facts and figures that have developed from the extensive operation of the United States Air Mail were made available in a paper on "Operation Facts from the Air Mail Service," read by J. E. Whitbeck, superintendent, Eastern Division, Air Mail Service. It is expected that the air mail data will find extensive application in the establishment of commercial air lines.

Mr. Gilmore gave an outline of the procedure adopted in constructing a racing airplane of general design features, and of the progress which has been made year by year.

When a contract is placed for a racer, he said, either by the army or navy, the specifications cover only a guaranteed high speed and a landing speed, the plane

manufacturer being given a free hand as to how the guarantee shall be met. The first procedure is to allocate the work to the various departments of the engineering organization, the design section taking care of the general arrangement and type of design. Very close co-operation within the engineering organization is required at this stage. It is usually possible to decide between two or more tentative designs by comparing speeds with last year's models on a relative basis. Next the work is definitely distributed to the design, structures, aerodynamical, weight and propeller departments.

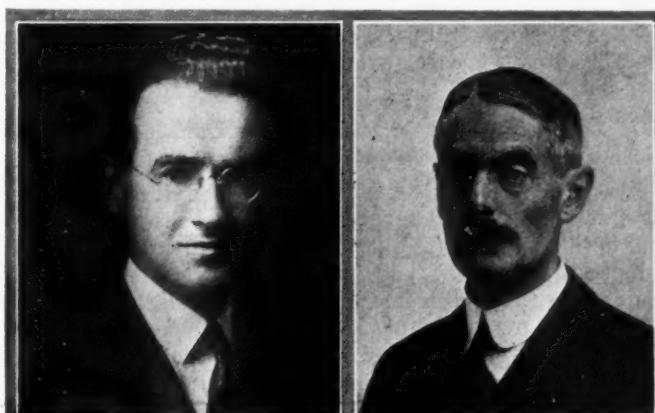
First a wing section adapted to the chosen design must be developed. To facilitate the testing of the experimental sections, a special modeling machine is employed which allows sample sections to be laid out, constructed and tested in the wind tunnel in six hours' time. As soon as the section has been decided upon, an accurate weight estimate of each part of the complete airplane is made by the weight department. When the parts and total weight of the complete plane are determined, a weight schedule or bogey is posted in a conspicuous place in the engineering department. Drawings are not released to the shop unless the bogey weight is made or bettered; in case of over-weight a redesign is automatically called for.

Having the weights, the wing and tail areas are calculated and a new layout is prepared to determine the sizes of the various members. At this point, a fairly definite idea has been obtained as to the overall dimensions of the plane. The engine, oil and fuel tanks and the pilot have been crowded into a fuselage, of a cross section only slightly greater than that of the engine. A model carved by hand out of mahogany is an exact duplicate, although only one-twelfth the size of the full size airplane. The model serves a three-fold purpose: It gives the designer a picture of the complete airplane; it is checked in the wind tunnel to determine its speeds at various angles, and last, and perhaps most important of all; the controllability and stability of the racer are determined in the wind tunnel.

Plane is Sand-Tested

After this the final design is made up and the construction of the component parts is begun. After the subject of a contract is completed, the plane is carefully sand-tested, in order to be doubly sure that no defects exist and that the ship will bear up under the gruelling flights and manoeuvres to which it will be subjected.

This year's racer was static-tested to simulate high speed, low speed and inverted flight conditions. In addi-



George J. Mead, Pratt & Whitney Aircraft Co., (left), and Henry M. Crane, General Motors Corp. The former discussed aspects of airplane engine development, while Mr. Crane explained the new aeronautical safety code.

tion to testing of the control system and surfaces, the machine was sand-tested to simulate side wind landings, two point and tail skid landings.

Only a few changes were found necessary as a result of these tests, and in view of the manner the plane stood up under the loading, the 1925 Curtiss racers are without a doubt the strongest airplanes ever constructed for either the army or navy.

Each year's new type is the result of a process of development which extends over a period of five or six years, rather than the work of a six months' period. In order to progress year by year, a skilled staff of engineers is required who have the ability not only to conceive new ideas but also to improve upon old ones.

Commercial Aviation

W. B. Stout, after defining commercial planes and commercial aviation, went on to say there are two major requirements that must be met before we will have real commercial air lines. The first is the production of a real aircraft engine—air-cooled and without electric ignition if possible. The second is absolutely dependable navigation apparatus, which presumably will be based on radio principles.

Such a commercial airplane and equipment do not exist today, but they are in sight and are probably not over 18 months away. How fast they will come into use will depend upon the money and effort we are willing to spend during the next few years to get results.

In strictly commercial work the cubic capacity of the carrying space is important, and the 30-60 cu. ft. of the air mail planes will not suffice. The cabin of the Stout airplanes, which make round trips from Detroit to Chicago and Cleveland each day, have 280 cu. ft. of room. Sometimes the floor is merely covered, when forgings and other parts needed for the production lines are transported, while at other times the whole cabin is filled with such merchandise as bales of curled hair. The loads vary from 1,000 to 1,500 lb., averaging 1,200 lb., in addition to which 150 gal. of fuel and 14 gal. of oil are carried, and often also an extra pilot in training.

For three months of operation the average speed of operation between Detroit and Chicago was 96 m.p.h., but then bad weather set in and the average dropped to 93 m.p.h. While this plane has proved quite practical for flying over level country, it would not be adapted for flying in mountainous regions, which calls for multiple-engined planes.

The chief difference between military and commercial planes is that, whereas the former never spend more than 5-6 hours per week in the air, the latter must be kept in the air a much greater proportion of the time and therefore must be much more sturdily built, and yet must not be any heavier.

New Type of Engine Needed

So far modified types of automobile engines have been used for commercial airplanes, but Mr. Stout expressed the opinion that an entirely new type would be developed. For every pound reduction in the weight of the engine the plane itself can be made lighter by half a pound, hence the total saving amounts to a pound and a half, which gives an advantage of 30 cents per hour. Commercial planes must carry fuel enough for at least five hours' flight, hence fuel economy is as important as reduction of engine weight.

It is practically certain that the engines of the future commercial plane will be on air-cooled lines. The engine must have a life between top overhauls of 300-500 hours and must be so simple that two men can com-

pletely overhaul it during the night and have it ready for a test flight the next morning.

The ground organization is even more important than the machine, or will be once the latter is available, but air laws and all the landing fields in the world cannot give us commercial aviation if we have no commercial planes. Most of the work of the ground organization will be on the engine, for that is almost the only part subject to wear. Experience indicates that it is an advantage to manufacture these power plants of a series of complete minor assemblies, so that in case of trouble any assembly can be readily replaced.

It does not pay to make an airplane engine heavier to increase its freedom from service requirements, for the addition of 100 lb. to the weight of the engine decreases the load capacity by 200 lb., and the daily earning of 200 lb. freight capacity will pay for considerable servicing.

Mr. Stout gave the following specifications of what he thinks the commercial airplane will be in three or four years:

1. Absolute reliability of structure under all conditions of weather and immunity from fire hazards.
2. Absolute dependability of power plant, secured possibly, by the use of multiple engines.
3. A speed, on not more than three-fifths of the maximum horsepower, of 100 m.p.h. with full load, horizontal flight at sea level. Pilot forward for complete visibility will be required when planes become common over air routes, particularly in bad weather. A pay load of at least 4 lb. per hp. with a full supply for six hours.
4. Ability to operate 20 hr. per day in the air with load—lights being provided for night flying, of course.

In speaking on "The Light Airplane and Low-Powered Flying," Mr. LePage recalled the shortcomings of the early planes with their poor control, a low rate of climb, a ceiling only a few hundred feet high and a speed range of only a few miles. It took a highly skilled flier, he said, to operate one of these early machines successfully.

Increase of Engine Power

During the war period all attempts to improve the performance of airplanes were directed toward the increase of engine power, and the rational application of aerodynamic principles to plane design dates properly only from the end of the war. One of the first machines of high aerodynamic efficiency was the Manning Wren, which, with an engine of 24.3 cu. in. displacement, had a flying speed range of 23-50 m.p.h. and a rate of climb of 200 ft. p. m.

However, owing to the extremely low wing loading, control is not reliable under adverse weather conditions and on account of the small engine power the rate of climb is inadequate. What improvement in aerodynamic qualities have been made is shown by the fact that a lift-horsepower ratio of 30-35 is common and an extreme ratio of 60 has been attained, as compared with a ratio of 5-8 lb. p. hp. in regular commercial and military machines. But in order to give a satisfactory rate of climb an increase in engine power is necessary.

In the small machines referred to, the weight of the plane structure is necessarily greater, proportionately, than in larger machines, amounting in most cases to over 44 per cent of the total weight, whereas in the larger machines with the same factor of safety it ranges around 33 per cent. But the load carried by the small machines constitutes a considerably larger percentage

Left—W. Laurance LePage, Gardner Publishing Co., who read a paper on "The Light Airplane and Low Powered Flying." J. E. Whitbeck (center), of the Air Mail Service, P. O. Dept., explained some of the details of operating the Air Mail Planes. Right—J. Parker Van Zandt, U. S. Department of Commerce, who talked on "Reliability in Operation."



of the total weight than in the case of the larger machines—up to 40 per cent as compared with 25.

The most difficult problem in connection with these light machines is undoubtedly that of control. Owing to the light wing loading the ordinary rules for area of control surfaces required do not apply. The engine also constitutes an important problem. The engine must be reliable and light in weight under running conditions. Reduction in weight is a more difficult problem in connection with the small than with the large aircraft engine, because the weight does not scale down in the same proportion as the output.

More Reliable Than Trains

In his paper on the reliability of airplane transportation, Mr. Van Zandt showed by comparative figures that the Air Mail Service has already established a better on-time performance record than the railroads. He said, in part:

"The consumer of the commodity we call 'transportation service' has a very simple way of measuring its efficiency; that is, in terms of its practical value to himself. The five principal factors which determine this value for the user are: Reliability, Safety, Rapidity, Cost and Availability.

"When the user has a choice of two different forms of transportation service over a given route, it is the *relative* standards of the two services which most interest him, and not the *absolute* values of these factors. This relation, expressed algebraically, may be called the fundamental equation of transportation efficiency.

"The factor of relative reliability in this equation is isolated for discussion and its value is determined for rail and air transportation for the New York-Chicago route.

"The average on-time regularity of trains is shown to vary from 74 per cent in February to 88 per cent in May, with an annual average of 81 per cent. These figures are for New York State trains, and are shown to be also reasonably representative for the fast trains between New York and Chicago.

"The average on-time regularity maintained by the Air Mail over the same route for a two-year period is shown for a number of schedules based on different ground speeds. For a ground speed of 70 m.p.h. or about 25 m.p.h. less than the present planes' cruising speed in still air, the on-time performance varies from 73 per cent during winter to 98 per cent during summer, or an annual average of 85.8 per cent.

"Hence, on a properly chosen time schedule, aircraft can now be operated with a better on-time performance than trains. This schedule must be chosen approximately 25 m. p. h. slower than the planes' cruising speed, in order to take proper account of the frequency and strength of opposing winds.

"By failure to make this allowance in its announced schedule for the New York-Chicago overnight service, the Air Mail is inviting discredit on itself; and operates to obscure the true, dependable qualities of air transportation. In fairness to itself and to the public, this schedule should be based on a ground speed at least 15 m. p. h. slower, or new aircraft should be employed with cruising speed at least 15 m.p.h. greater."

Mr. Crane said that five years were required in the preparation of the Aeronautical Safety Code, which, having been accepted already by the Bureau of Standards, will now become a tentative code for American Aircraft Standards. The code is not considered to be definite in its present form, as it can be appreciated that within five years or so aircraft tendencies and trends will warrant certain somewhat radical changes.

It is the intention of the committee to urge Congress to base future aerial legislature on the safety code. Up to the present it has no legal application. It is intended to put the code into operation immediately, and manufacturers, together with operators, are requested to adhere to the code regulations, as it is realized that civil air lines in the future will expect the specification of airplanes to conform with the recommendations of the safety code.

The S. A. E. in preparing the code has worked closely in conjunction with Government departments and organizations, functioning under the procedure of the American Engineering Standards Committee, the whole contributing to make the code a reality. All three phases of the aircraft industry, airplane design, construction and operation have been gone into most thoroughly.

Details Need More Attention

Reviewing developments in aircraft propulsion, Mr. Mead said overall powerplant efficiency could be raised more rapidly if greater attention were paid to details that have so far been considered relatively unimportant. The whole problem of propulsion should be considered and not the engine aspect separately. Safe flight depends upon three principal factors, namely, the ratio of the thrust in pounds to the weight of the powerplant, which ratio may be called the overall powerplant efficiency; the drag

of the plane structure and the dependability of the power-plant.

The overall efficiency can be expressed in the form of a fraction of which the thrust forms the numerator. The amount of thrust depends upon the power of the engine and the efficiency of the propeller. For a given power, the loss of availability thrust by the propeller is approximately 25 per cent under the most favorable conditions. Losses as high as 35 to 40 per cent are apt to be encountered, particularly when a poor relation exists between the plane and the propeller speed. For years we have striven for the minimum weight per horsepower, only to turn our backs on the problem of efficiently transferring the power we have made available to usable thrust. As a result of this shortsightedness, many a lumbering old powerplant gives better plane performance than a lighter modern engine, because the older engine turns its propeller at a relatively slow speed and may have an efficient propeller besides.

Not Fault of Engineers

This situation is not the fault of our propeller engineers, even though it may seem so. They have not had a chance. As a rule they have nothing to say about the propeller speed, only its design. From my experience, relatively little time is given the consideration of the most efficient propeller speed or the selection of the proper propeller in comparison with the effort spent upon the engine or plane engineering. As a matter of fact, with all our boasted research, no one has ever answered the question of what is the proper relationship of propeller to plane speed for minimum slip. The Bureau of Aeronautics now has under way certain experiments which will undoubtedly provide a great deal of worthwhile data on this subject. With weight carrying ships of all kinds, owing to their comparatively low speeds, poor propeller efficiency is a particularly serious matter. Proper reduction gearing is one solution of the problem. Variable speed gears are even apt to be worthwhile, especially with supercharged engines.

In the denomination of the fraction, the weight providing the thrust, are certain variables depending upon the duration of flight as well as the efficiency of the engine. These need not be considered for the moment. There are, however, certain fixed values of particular importance such as engine weight, cooling system weight, and fuel and oil consumption. Most of our development has been concentrated upon the engine weight. As a result it is reaching a minimum per horsepower. "Reaching" is used advisedly, as the absolute minimum will never be reached. However, the curve is flattening, so that no startling gains will probably be made in this direction in the near future.

Saving Weight and Fuel

Just as important, and in some ways more so, are the other items in the denominator. The cooling system weight is approximately 0.60 lb. hp. for water-cooled engines. With air-cooled engines, for example, this item can be eliminated. There have been no improvements in the water cooling system, but gains are certainly possible. Fuel and oil economies are just as important as the other items and much more so in long distance work where the fuel and oil weight often exceeds that of the engine many times over. We could well afford to add weight to the engine if it would save something in fuel. For example, suppose twenty-five pounds added to a 400 hp. engine made a difference of from .55 and .45 in fuel consumption. In an hour's

operation at full throttle 40 lb. of fuel is thus saved, which results in an overall saving of 15 lb. for one hour's flight. The answer is obvious. We need a more worthwhile figure of merit for comparing engines which will bring in the principal powerplant weights in addition to the engine weight. It is obvious that these other items have as much bearing on overall efficiency as dry weight per horsepower. As long as we are reaching a minimum value for that item it is time to turn our attention to the others.

A better yardstick is required for determining the relative value of various powerplants. It is suggested that such a figure be obtained as follows: The sum of the dry weight per horsepower plus the weight of cooling system per horsepower plus the fuel consumption per hp.-hr. plus the oil consumption per horsepower. This figure is of no particular value except as a measure of the overall efficiency of the powerplant. Obviously, true importance is not given either the fuel or oil consumption. On the other hand, for general comparative purposes it is distinctly valuable in placing the various values in their proper light.

Everyone grants that a pound saved in the plane, either in structure, powerplant, or fuel, means a pound additional pay load. Under these circumstances, it is hard to reconcile the use of old water-cooled plants instead of their modern air-cooled successors, even though the initial cost of the old equipment may be considerably less than that of the new. Not to carry the maximum pay load is practically as serious as to have an idle plane. No operator of a truck or bus fleet could be sold the idea of using equipment that was eight years old, even though it might be literally given to him. Yet this is exactly what some of our foremost aeronautical engineers are recommending. It is bad enough to use old equipment, but much worse to carry around unnecessary weight. It is to be hoped that commercial aviation will appreciate the true value of the modern engine, and particularly the air-cooled type when the gains to be had in pay load capacity are considered in connection with increased reliability.

Dependability Comes First

Dependability is the most important of all requirements as, after all, the whole success of flying hinges upon it. Any improvement is valueless if it in any way detracts from this prime requisite. Unfortunately it is often overlooked in any endeavor to catch up with the weight-per-horsepower bogie. Many designs are lightened to a point where fatigue failures occur in highly stressed parts long before the engine as a whole has outlived its usefulness. Beyond this, gasket surfaces are reduced beyond the irreducible minimum, with consequent oil and water leaks, pistons shorten until their aspect ratio is impossible, studs made so small that the conscientious mechanic with a wrench not shown in the instruction book can cause considerable damage, etc.

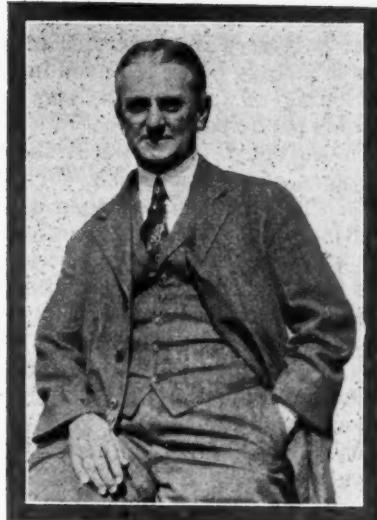
These extremes cannot be tolerated, nor are they even worthy of serious consideration until we have secured reasonable efficiency in other directions. When the relative importance of the various requirements are thoroughly understood it is obvious that considerable improvement can be made in the overall efficiency of our powerplants. Limitations are being set up which will ultimately arouse us to the error of our ways. No one ever admits he likes limitations, but they are certainly necessary for progress. The Navy now has both weight and space limitations for planes. Commercially, the dollar, as always, will limit us and force the adoption of the greatest all-around economies, and consequent study of all sides of the problem.



E. P. Chalfant, president, M. & A. M. A., and vice-president, Gill Mfg. Co., presided at several sessions and was prominent in discussion.



Francis H. Sisson, vice-president, Guaranty Trust Co., New York, was optimistic about business conditions.



M. L. Heminway, general manager, M. & A. M. A., spoke on the prospects for accessory and parts sales in Europe.

Business Outlook Inspires Optimism at M. & A. M. A. Convention

Motor and accessory manufacturers pleased with prospects for immediate future. Importance of jobbers stressed. Merger with A. E. A. approved "in principle" but definite action is delayed

OPTIMISM about the immediate future for automotive business and emphasis on the jobber as a means of distributing automotive equipment ran through most of the discussions at the annual meeting of the Motor and Accessory Manufacturers Association, which was held in Montreal, October 7-10.

The plan of merger with the Automotive Equipment Association, presented for discussion at the convention, was "approved in principle" and the committee handling the negotiations is being continued. The committee will prepare a report which will be acted upon at the January meeting of the M. & A. M. A.

Business Planning

The importance of business planning and of tying up market analysis with production control also was given attention, while the need for consistent and steady effort if export markets are to be held was brought out forcefully at the session devoted to foreign trade. The general business problems discussed included an outline of the value of appraisals as an aid to good management and a description of the workings of the Federal Arbitration Act.

Credit affairs, which usually have had a part in M. & A. M. A. convention discussions, came in for relatively little attention this year, although some time was spent on this topic on the last day of the meeting. This can-

not be construed as any diminishing of interest in the credit situation, however, as the debate on the proposed M. & A. M. A.-A. E. A. merger plan plainly showed. It was apparent that, from the standpoint of a good many M. & A. M. A. members, the desirability or non-desirability of the merger lies primarily in its effect on the work of the credit department.

Introducing the speakers at the opening session on Wednesday, E. P. Chalfant, president of the association, struck the keynote of the convention.

"This has been a big automotive year," he said, "because good demand has been met by conservative production policies. We had profits in the accessory and equipment end but we have failed still to bring them to a satisfactory level. This can only be done by good management."

A better outlook for world business than at any time since the war was seen by Francis H. Sisson, vice-president of the Guaranty Trust Co. What is needed above everything, he said, is the realization by American business men of how closely their interests are interlocked with the commerce and industry of foreign countries. If Europe were to pay the war debts and stabilize currencies, the United States would have to give up some gold and either increase imports or decrease exports, either of which would cause temporary embarrassment and require adjustments of the commercial structure of the country.

"Crop conditions abroad are excellent," said Mr. Sisson. We calculate that there will be 200,000 more bushels of wheat harvested this year in Europe than last. This situation is already being reflected in improved exchange and a broadening of international trade, in which the United States is participating.

"In Europe there are still shortages of liquid capital, shortages of gold, unstable currencies and inflated wage levels. The economic changes of the post-war period are resulting in the establishment of new trade routes, new lines of commercial and industrial effort. But tariff barriers are retarding the working out of these economic adjustments. Debt settlements are another disturbing factor, because they mean higher taxes, which retard industry. The nations of Europe must pay in either gold or goods, and with the United States holding such a large proportion of the world's gold, and maintaining a large export balance of trade, this cannot be done without fundamental changes.

Not Job for Politicians

"The problem is not one to be worked out by politicians. The United States, if the war debts are to be paid, must face a reversal of trade balance and a redistribution of gold. If our present foreign trade is to be maintained there must be a big expansion of imports. It is unlikely that the process can be worked out without temporary maladjustments, including a scarcity of credit.



Merle Thorpe, editor of *The Nation's Business*, argued against the practice of going to Washington for governmental control of business situations which business itself was capable of ironing out.

"But all the nations, including our own, will benefit in the end, and this is why American business men should recognize the world community of economic interest, and strive for the common end."

Taking as his topic "Putting Good Management to Work in the Automotive Equipment Industry," William T. Morris, vice-president of the American Chain Co. and president of the Automotive Equipment Association, stressed the need for co-operation in the elimination of waste and inefficiency in automotive merchandising.

"Our first step is to eliminate needless waste of time and money in association activities," said Mr. Morris. "Our next step is to get our own house in order in every branch; the next step is to assist the distributor to accomplish the same object; and the final step is to complete co-operation between manufacturer, distributor and retailer for the benefit of the consumer."

"I am of the opinion that the greatest weakness in the larger units of business today is the fact that they are made up of departments, each with a manager striving to make a showing for his department, and they have a ten-

dency that co-operation between departments and unified effort for the benefit of the business as a whole is more important than the showing of the individual department."

Merle Thorpe, editor of *The Nation's Business*, described the American tendency to look to the government for relief from business troubles.

"We are too apt to regard Washington as made up of supermen with the power to perform an economic miracle by passing a law," said Mr. Thorpe, "when as a matter of fact it is just a good cross-section of American citizenry. When we think the price of sugar is too high we ask Washington to pass a law to lower the price. When we think the price of wheat is too low, we ask Washington to pass a law that will raise the price.

"Sometime in our lives we have all, most likely, been very active members of the great American choral society that has for its favorite number the popular anthem, 'There Ought to be a Law' and this means 'Let Government do it,' when in our own interest—in the interest of business management—business should do the regulating itself."

After a spirited debate on the proposed merger of the Automotive Equipment Association and the Motor and Accessory Manufacturers Association, the M. & A. M. A. passed a resolution approving the plan "in principle" and directed the committee to continue the gathering of data and preparation of a report to be passed upon at the January meeting of the association.

The interest of the members in the project was strikingly demonstrated Thursday afternoon during the discussion. Nearly everyone arose at one time or another to ask questions or make suggestions, and several new and interesting points of view on essential details of the merger were brought to light.

The preliminary report of the committee disclosed the tentative basis for the merger. The resources of the two associations would be combined and the activities united so far as would be feasible. The board of directors would be elected on the zoning plan of the A. E. A. with equal representation for manufacturers and jobbers on the board. The dues would be about \$400 a year, with a rebate for traveling and attendance expenses in connection with meetings.

Would Have 800 Members

It was pointed out that the combined associations would have nearly 800 members and with the added strength would be able to function more effectively in the matters of common interest to the automotive equipment and accessory industries.

The credit service of the M. & A. M. A. might be expanded to include a service for jobbers on the retail trade; more production and sales information would be made available; and the manufacturers of the M. & A. M. A. would gain the privilege of exhibiting at A. E. A. shows and of forming other valuable relations with the distributing end of the industry.

A large part of the ensuing discussion ranged about the question of whether the Credit Department of the M. & A. M. A. would be able to operate as effectively when in an organization containing jobber members.

To this answer was made that the A. E. A. has had no trouble in functioning with both jobber and manufacturer members. The two groups meet separately on confidential matters and the records of the meetings are not open to examination. The credit departments of the manufacturers and jobbers could be conducted separately in the merged organization.

This led to another point of issue. The A. E. A., it was said, is starting on an ambitious program of obtaining credit information on dealers, a costly undertaking and one without particular interest for the manufacturers. In

reply it was declared that whatever would benefit the jobbers would also aid the industry as a whole and that under the A. E. A. plan the cost of gathering the credit information would not be excessive.

The question of whether manufacturers who do not distribute through jobbers have anything to gain from the amalgamation was given some attention. These members were assured that the present activities of the M. & A. M.

A., of value to all, would be expanded under the amalgamation plan, and that in matters of general benefit to the industry the new association would be much more powerful and effective.

It was asked which association would bring the larger resources to the merged organization. The reply was that the A. E. A. was slightly stronger in total resources and the M. & A. M. A. in resources per capita.

Effective Use of Jobbers and Business Analysis

M. & A. M. A. merchandising surveys aid business planning. Means of stabilizing production outlined and results shown

MEANS of analyzing business problems and trends and of predicting with reasonable accuracy what is to be expected in the future were outlined by several of the speakers on merchandising topics, while others who talked on sales policies laid particular emphasis on the importance of the jobber as a factor in the distribution of automotive accessories and parts.

Actual results of special merchandising surveys were presented and one speaker told how production variations can be studied for the purpose of predicting future needs and thus making it possible to get something like continuous production. The jobber question was discussed both by a jobber and a manufacturer, but both agreed as to the major points of jobber-manufacturer relationships.

Adair Describes Surveys

The percentage of gross sales being spent in advertising by manufacturers of parts for original equipment is slightly less in 1925 than it was in 1924, according to results shown in one of the special merchandising surveys described by Neal G. Adair, manager, educational department, M. & A. M. A., in his outline of the work of his department.

The advertising survey, which includes data from representative parts and accessories makers, shows that a group of twenty-one original equipment makers spent .84 per cent of their gross sales in advertising in 1924 and that they will spend .71 per cent of their estimated gross sales for 1925. A group of six replacement parts makers will spend a little more in 1925 than they did last year, the figures being 2.34 per cent and 2.38 per cent. Eleven accessory manufacturers have the highest percentage of advertising cost—8.1 per cent in 1924 and 6.3 per cent this year. Ten service equipment makers reported they spent 5 per cent in 1924 and will reduce the percentage to 4.2 per cent in 1925.

More detailed breaking up of the data on advertising disbursements shows the following:

How Appropriations Are Divided

	Original Equipment	Replacement Parts	Accessories	Service Equipment
Salaries	4%	9%	17%	5%
Trade Papers	71%	25%	23%	42%
Magazines and Newspapers	6%	5%	18%	4%
Literature and Display Features	12%	58%	26%	30%
Shows	6%	3%	3%	5%
Outdoor			8%	
Other Expenses	1%		5%	14%

The other two special surveys which have been made under Mr. Adair's supervision were on price margins between original equipment and service parts and on

practices in furnishing vehicle manufacturers with sample parts.

While Mr. Adair did not give detailed results of these two investigations he pointed out several outstanding features which have been developed by them.

One phase of the parts price survey, which covered a



Three Speakers—left to right: S. E. Nichols, general manager, Elin Auto Supply Co., gave the jobber's viewpoint on distribution practices. Neal G. Adair, manager, educational department, M. & A. M. A. gave the results of special sales surveys. Joseph H. Barber, assistant to the president, Walworth Mfg. Co., talked on turnover problems.

group of typical original equipment manufacturers, showed that virtually all of them charge a higher price for replacement parts of units furnished the vehicle manufacturer than for the complete assembly. The sample parts survey showed that "while original equipment makers, as a rule, consider it good business to practice liberality in providing samples for testing by vehicle manufacturers, a considerable number make some kind of charge for this service, running all the way from full cost billings in the case of small manufacturers to labor or material coverage in the case of prospective large buyers."

Complete details of these two surveys will be available very soon, Mr. Adair said.

He went on to outline the regular activities of his department, laying special emphasis on the M. & A. M. A. Business Bulletin, which so many members have been finding of great practical value in business planning. He mentioned also the regular services in the form of bulletins keeping the membership informed of legislation,

Government rulings and other happenings affecting the industry. Further special merchandising surveys are to be undertaken in the future, Mr. Adair said.

Details of how a central office policy of production control against market demand was established by a company carrying a 23,000 item line were outlined by Joseph H. Barber, staff assistant to the president, Walworth Co. It was found possible also, in this case, to vary relatively the different assortments or types of materials according to market requirements. In this way material turnover economies were secured.

Series of Product Studies

These results were accomplished by a series of product studies which were very fruitful. "One would naturally assume," Mr. Barber illustrated, "that in a building using, let us say, black pipe and fittings, there would be certain average needs for about so many 90-degree elbows, so many tees, so many shut-off valves, etc. If fifty buildings were built and each of these buildings were piped according to the same specifications each of those fifty buildings would also use about the same assortment of fittings. In many other of our assortment charts we have demonstrated that there is just that sort of a tendency—that there does exist just such a rule of the business. In other words, usual assortments of product tend to be maintained regardless of the total grand volume."

Continuing his explanation, Mr. Barber said: "We then demonstrated the rule that the 90-degree ell might be considered the typical fitting to represent the movement of all fittings in the same 'size family.' That is, for every 1,000 of the 2-inch size of 900 pipe elbows of a certain style, there would be sold, let us say, one-half as many 2-inch tees, one-quarter as many 2-inch 45-degree elbows and so forth. This assortment represented a cross section of demand with reference to a given size of product.

"What might be called vertical cross sections through the lines of product were studied. Here it was found that of a total line of product, let us say, in the case of all sizes of 90-degree black cast iron elbows, that the 2-inch size constituted a usual percentage of the total of all sizes of 90-degree elbows sold, regardless of the volume moving into the market.

"Having these rules established, it was suggested that a typical item of the line might be substituted as a representative item that would reflect the characteristics of the line as a whole and of each item in that line. . . . We found that, within any one of the product classes, all the typical or popular T items tended to move up or down in the same percentage as did the class as a whole.

Study is Concentrated

"Thus, having established the rule that class assortments are essentially maintained regardless of class volumes, it became possible for the central office to concentrate its market studies upon a relatively few controlling accounts.

"It has been possible to develop a technique for forecasting market demand separately for each of the product classes. Such forecasts have proven out surprisingly accurate and they serve well as an adequate guide for the necessary general office co-ordinating control of works production."

Nearly all of the troubles and the successes of the automotive industry are the result of speed; the jobber is an important factor in speeding up distribution and for that reason performs a function which no other agency has been able to fulfill, S. E. Nichols, general manager, Elgin Auto Supply Co., told the manufacturers in his talk on "How the Jobber Works in Automotive Distribution."

Supply sources must be selected as much for speed as

for any other single characteristic, Mr. Nichols said. He decried the attempts of some car manufacturers to strengthen the parts distribution of their distributors by trying to make the going hard for jobbers, pointing out the fact that even large, well-organized distributors in nearly every case come to the jobber for some items and particularly call on the jobber when they need quick service.

He opposed the practice, common among some parts manufacturers, of selling certain items of their line direct to dealers, while expecting the jobbers to handle the other items in their line.

While urging fair treatment and proper utilization of jobber facilities, Mr. Nichols recognized clearly the incompetence of some members of the jobber group and stated clearly his conception of the sort of service which a jobber should be prepared to render if he is to have the consideration outlined.

What Good Jobber Must Have

A good jobber, Mr. Nichols said, should have six main characteristics:

1. Sufficient capital. Without capital he can't possibly do an efficient nor an adequate job.
2. Service ability. This should include technical service assistance to dealers as well as the usual forms of service.
3. Integrity.
4. Full coverage of the trade in his territory. This can be accomplished only through close control of salesmen's movements and activities.
5. Administrative trade contact. This should include such things as trade association contacts, knowledge of legislative happenings, following of economic trends and other broader aspects of the trade situation which are necessary to maximum success in the jobbing field.
6. Production of sales. Salesmanship is no good if it doesn't produce sales. Sales production is the final test of a jobber's ability.

The jobber has to handle his relations with dealers properly if he is to give adequate service to the manufacturers whose lines he is handling, Mr. Nichols said. A good many dealers are not good business men and need considerable help and education. Moreover credit practices have to be watched carefully. This phase has been taken care of in New Jersey, Mr. Nichols said, through a local trade credit association.

The modern jobber, Mr. Nichols believes, must have specialization within his own organization if he is to do a good job. Replacement parts cannot be handled by the regular salesmen, he said, basing his statement on his own experience, which has changed his ideas on this subject very materially in recent years. Mr. Nichols also outlined the functions performed by his jobber for the discount allowed to him by manufacturers, showing that he performs a very real service for the compensation which comes to him.

Procter Tells of Jobber Co-operation

R. W. Procter, sales manager, Black & Decker Mfg. Co., talking on "Making the Jobber a Partner in the Selling Enterprise," said that the jobber performs a very definite function for the manufacturer regardless of the manufacturer's method of distribution.

Basing his statements on an experience with jobber distribution covering a long period of years, Mr. Procter summed up some of the major advantages of this type of selling as follows:

"One advantage of jobber distribution is that it makes it possible for the manufacturer to have a jobber in



*R. W. Proctor,
sales manager, Black
& Decker Mfg. Co.,
told how to make the
jobber a partner in
the selling enterprise.*

nearly every city of 50,000 trading population in the country, with a stock of his merchandise from which he can make immediate delivery.

The jobber is well known in his own community, has established the reputation and gained the confidence of his customers. They have learned that they can depend on him and have no doubt or hesitation in purchasing from him. Very often they know him personally and feel that they can hold him responsible if any purchase was not entirely satisfactory. Frequently this is the deciding factor in a sale, particularly when the manufacturer is more or less unknown.

The jobber also acts as a credit shock absorber. He is constantly in touch with local conditions and has up-to-date credit information, which places him in a position to extend credit promptly and with less risk than the manufacturer. This makes it possible for the jobber to ship the goods and get his money while the manufacturer is getting the credit information, a delay which often means the loss of a sale.

"These things—confidence in the jobber, credit service and distribution of stocks are all very good, but after all the manufacturer has to depend on the jobber's salesmen," Mr. Procter continued.

"Too few manufacturers supply the jobber's salesmen with complete selling information arranged in such a

form that they can get the real selling points. Most manufacturers catalog pages consist of merely a description of the article and the price. The jobber's salesmen receive a continuous stream of literature from hundreds of manufacturers, so if you expect him to read yours, you have got to do something to keep it out of the wastebasket."

Mr. Procter then gave five points of the Black & Decker policy which he believes have been responsible for the success of that company with jobber distribution. They are:

"1. Sell Only Through Jobbers—

"We do not sell direct at any price. All orders we get are put through our jobbers.

"2. Aggressive Advertising—

"We do everything it is possible for advertising to do to develop the market, reduce sales resistance for the jobber's salesmen and increase the jobber's volume.

"3. Price Protection—

"We make a freight allowance which is shown on the face of our invoices. This enables us to establish the same resale prices everywhere in the United States.

"5. Personal Selling Assistance—

"A few manufacturers still feel that when the product is turned over to the jobber their responsibility ends. Some others consider that they have discharged their obligation when they have delivered the product—well made and well advertised—to the jobber. Theoretically this may be correct, and it would be mighty fine if the manufacturer could get distribution in this way. But you have to take the jobber as he is, and not as he ought to be.

"Recently," Mr. Procter said in closing, "I have asked a number of jobbers 'What is the most important thing the manufacturer can do to help you?' And the answer is nearly always 'Send us better representatives; men who know their stuff.' A few days ago a jobber told me he sold \$15,000 worth of a certain line last year. This is about three times as much as the average jobber of his size sells. So I asked him how he accounted for it, and he replied that the manufacturer's representative not only knew his stuff, but that he had demonstrated every point to every one of his salesmen so that they knew how to sell it."

Consistent Efforts are Needed in Export Selling

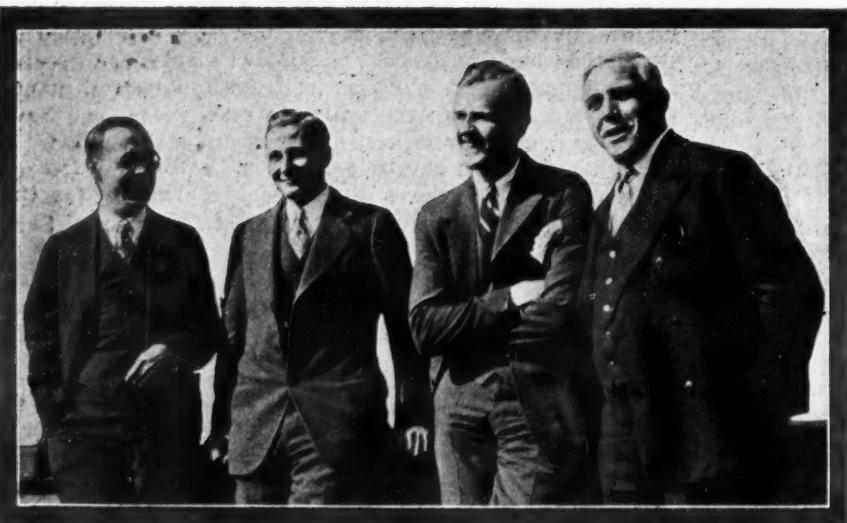
Parts and accessory markets abroad can be improved only by careful and steady work. Human factors play important part

AMERICAN manufacturers must handle their foreign markets with the same consistency of policy, honesty of dealing and carefulness of cultivation that characterizes their domestic merchandising activities if they are to hold or increase present overseas business. To regard foreign markets as a place into which excess production may be dumped when it suits the needs of the American maker means not only final failure in exporting for the company which permits such practices, but also a definite hindering of constructive work which may be under way by other automotive firms trying to build their export business on a permanent and sound basis.

This was one of the chief points emphasized at the session devoted to "Good Management's Opportunity in Foreign Trade" which was attended by about 50 men on Wednesday evening. E. C. Steinacher, export manager, Moto-Meter Co., Inc., presided.

The necessity for a permanent policy in foreign selling was strongly urged by C. R. Osborn, general manager, Overseas Motor Service Corp., in his talk on "Building Accessory Sales in Foreign Markets." The evils of "dumping" and loose trade practices were outlined by M. L. Heminway, general manager, M. & A. M. A., in his talk on "Automotive Business Prospects Abroad" and were supplemented in discussion by supporting views from E. V. Hennecke, vice-president, Moto-Meter Co., Inc.; E. P. Chalfant, vice-president, Gill Mfg. Co., and several others.

Discussing this phase of the automotive export situation, Mr. Heminway said that "the American manufacturer has looked upon Europe as a good place for the disposal of surplus stocks when he had them, obsolete styles or such articles as the foreign buyer might voluntarily order. In other words, he has not taken his foreign opportunities seriously and has not in the first place studied the needs



An Export Group—left to right: George Quisenberry, editor, *El Automovil Americano*; Walter C. Rink, sales manager, Stevens & Co., who talked on "The Human Side of Export Selling"; C. R. Osborn, general manager, Overseas Motor Service Corp., who talked on "Building Accessory Sales in Foreign Markets"; H. Deuster, secretary, M. & A. M. A. Foreign Trade Committee.



E. C. Steinacher,
export manager, The
Moto-Meter Co., Inc.,
who presided at the
export session.

and requirements of that market, nor has he made an effort to cultivate it in any degree as he would a new territory in the United States in which he has decided to sell his products."

Unfavorable comments have come from many foreign buyers for that reason, Mr. Heminway pointed out. He reiterated his view, stated when he first returned from Europe a few weeks ago, that the great variety of cars comprising the 1,900,000 vehicles outside the United States constitutes a serious handicap to the foreign sale of parts and accessories; that competition from foreign makers of these units is very keen; that foreign buyers, generally speaking, favor their native manufacturers, and that the chance is slight of American parts and accessory manufacturers supplying foreign car producers with original equipment.

Correct Survey Difficult

Service equipment, however, can be sold now, in Mr. Heminway's opinion. He does believe that there is room for the development of a sound foreign business in parts and accessories, but emphasized the need for very constructive effort to make plans successful. "Even more intelligence is necessary for a correct survey abroad," he stated, "because of the differences in language, customs and requirements." He closed his discussion by saying:

"While at first I may have seemed to lack enthusiasm over the value of the foreign market, at present I do believe that there is a big and growing field there for many of our products if we will attempt the development carefully and prepare for the long haul."

In addition to emphasizing the need for a permanent orderly development of foreign sales, Mr. Osborne gave it as his view that the best method of conducting automotive overseas business is by means of a factory export manager, functioning through direct factory territorial representatives in different countries who in turn will appoint and assist distributors and dealers.

Heavy Expense Involved

The chief objection to this method, he pointed out, is the expense involved. For this reason, many companies prefer to operate either by direct correspondence with jobber and distributors, whose names can be obtained from reliable lists; through commission houses; or through a set of distributors, each of whom has been given exclusive rights for a certain territory.

The expense of the factory export manager—factory foreign representative method can be met very well, he pointed out, by the association of a number of non-com-

peting lines for export purposes. Such a plan, he showed, is the basis of the Overseas Motor Service Corp., which operates along these lines. This organization, he said, was built up gradually, representation having been obtained first in countries where a reasonably good market already existed. Now representation has been obtained in practically all parts of the world.

The efficiency of the organization, Mr. Osborne said, is helped materially by having home office executives get into foreign fields frequently and by having the foreign representatives make periodic trips to the home office.

Credit, he pointed out, is one of the most important phases of the present export sales situation. American companies must be ready to handle credits themselves to some extent, he said, if they are to achieve maximum success.

Departmentalization Urged

Mr. Osborne urged departmentalization and separation of functions in the export department as an aid to effective handling of sales and offered five major items of special importance in overseas activities. These were:

1. Follow customers' orders exactly and carefully.
2. Do not try to use foreign markets as a dumping ground for excess production.
3. Choose a distribution plan carefully and then stick to it.
4. Give export orders preference over domestic orders on account of the longer time necessary to transport goods from factory to consumer.
5. Study each territory carefully so that policies may be varied in accordance with the needs of particular areas; don't set a single policy and expect it to apply everywhere without modification.

Understanding is the basis of all business, Walter C. Rink, sales manager, Stevens & Co., pointed out in his talk on "The Human Side of Export Selling." Because of the wide variety of peoples and customs involved in overseas business, he said, the human side is of particular importance in this type of selling. He illustrated the different buying methods used by Scandinavians, Germans, South Americans, Englishmen and Australians, saying that, to his mind, the Australian buyer comes closer to being like an ordinary American purchaser than does any

other foreigner. He urged the need for extreme courtesy in dealing with Latin-Americans and emphasized the desirability of remembering to give special attention to human contacts with the foreign factory representatives of the organization as well as to foreign buyers.

It was brought out in discussion that a number of European manufacturers are copying American parts and are selling them to replace worn out parts in American-built cars abroad. In some cases these parts are not properly covered by European patents.

Installment Buying is Discussed by Credit Men

Analysis of credit risks is subject of talk by T. M. Simpson.

Many items in business statements will bear careful checking

IT was the general opinion of the credit men at the convention that installment buying is here to stay as an American institution and that there is nothing particularly dangerous in the situation as it stands today. Discussing this topic at the credit question box session on Friday afternoon, however, several credit managers pointed out the necessity for watching the installment situation carefully as related to general business conditions. It seemed to be recognized that terms which might be safe under generally prosperous conditions might quickly become unsafe should the general economic situation change.

One tire company representative pointed out that this company sells to dealers on 30 days' time, while the dealers, on the average, do not collect the money for the goods under 4 months. He asked whether manufacturers are going to have to increase their working capital to give longer terms to dealers.

The predominating sentiment was that such capital increases would be neither necessary nor advisable. The ill effects of pyramiding credit back through the merchandising line to the manufacturer were clearly shown.

It was pointed out in the credit discussion that too liberal credit sometimes works to the detriment of jobbers, because manufacturers will sell them goods so long as pay-

T. M. Simpson, secretary, Continental Motors Corp., told how to analyze a credit risk.



David Beecroft, Chilton Class Journal Co. (left), and E. V. Hennecke, general manager, The Moto-Meter Co., Inc., who presided at one of the sessions and was prominent in the merger discussion.

ment is assured, despite the fact that the sale to a particular new jobber may hurt materially the business of other jobbers in that territory handling the same line.

Talk about sales and credit department relationships brought from Ben Asch, Asch & Co., the statement that the salesman is in a better position than the credit man to estimate the true value of a jobber inventory. Several



B. M. Asch, president Asch & Co. (left), was chairman of the program committee. On the right is Geo. Fleming, Fleming Machine Co.

other speakers brought out the many opportunities the credit department has to help promote sales; it was generally agreed that the credit department should be organized and administered as a sales builder.

Just before the questions on credit were brought up, M. W. Drayton, president, Montreal Automotive Jobbers' Association, talked to the credit men on merchandising problems involved in manufacturer-jobber relationships.

T. M. Simpson, secretary, Continental Motors Corp., was the chief speaker on credits, his topic being "Analysis of a Credit Risk." He pointed out the various ways of checking up the financial standing of a company and especially of discovering the weaknesses often lurking behind a favorable balance sheet.

Cash Not an Item Apart

With regard to the asset side of the balance sheet, Mr. Simpson said that cash should not be considered as an item apart—it must be studied in relation to other items, particularly inventories, accounts payable and bank obligations.

Under receivables uncollectable items, are frequently included notes and bills that should have been written off long before the statement was issued. Goods are frequently sent out on consignment, with no possibility of collecting for a long period, if at all, but the receivable account is duly credited.

Inventories are not always what they appear, Mr. Simpson continued. He gave instances where large inventories were carried of parts and materials that entered only to a small degree into current production, and would require years to be entirely used up. Manufacturers would acquire large stocks of items just because the price was low, without regard for their production needs. New models, also, frequently brought about the necessity for scrapping as obsolete parts carried as inventories.

Mr. Simpson urged careful scrutiny of items carried as investments. Branches are often, he said, carried as investments, instead of as deferred charges to be written off over a period of years. Real estate and equipment, he pointed out, is often the most important item aside from quick assets, since the creditor in event of trouble must fall back on the property of the bankrupt. He said that automotive concerns had invested in some cases too much in office buildings and plant and carried these at their replacement cost rather than at the sum they could bring at an open sale.

Royal T. McKenna,
General Counsel, M.
& A. M. A., ex-
plained the U. S.
Arbitration Act.



The accounting of all subsidiary companies, such as real estate and branch organizations, should be examined for the purpose of discovering the doubling of assets. It is too frequently the practice, Mr. Simpson pointed out, for companies to create fictitious values on the balance sheet of the parent organization.

On the liability side, Mr. Simpson urged the need for finding what security, if any, had been given for bank loans. He said he knew of instances where companies had said there was no collateral for such loans when investigation later showed that bonds or other securities had been deposited with the bank to guaranty the notes.

Be watchful of the item "reserve for taxes," was another of the cautions issued by Mr. Simpson. Ample cash should back up these reserves, as failure to have cash to pay taxes had led to more than one bankruptcy.

Finally, Mr. Simpson stressed the need for assaying the management of a concern and its production and merchandising policies. He was particularly critical of the manner in which small car and truck factories sometimes have embarked on ambitious policies of expansion through branches. These branches, he pointed out, are expensive and usually lose money for three or four years.

Mr. Simpson in his talk was referring particularly to large accounts. Where a manufacturer has a great diversity of risk over a substantial number of small accounts, investigation might not be so vital.

Attention is Given to Appraisals and Arbitration

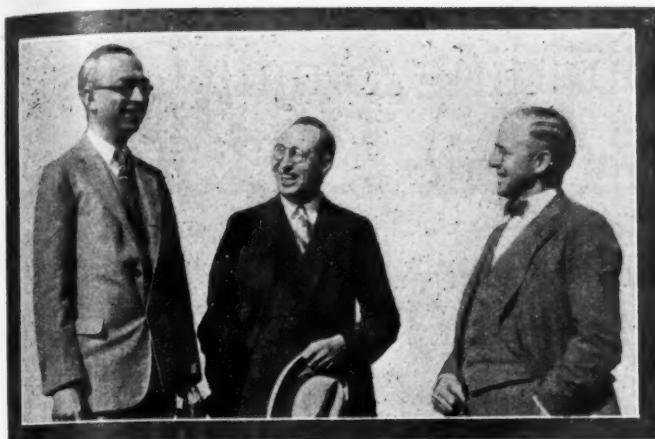
Full meaning and value of appraisal service not understood by most executives, speaker says. Arbitration Act explained

MOST managers do not appreciate the full scope and application of appraisal service and consequently fail to utilize such service to anything like the best advantage. This was the basis of the talk made by A. B. Hossack, vice president, American Appraisal Co., on "Appraisals—an Accessory to Good Management." "Appraisal still implies to many," Mr. Hossack pointed out, "the establishment of current costs of replacement and value to a going concern, with the usual division as to building and classifications."

Appraisals really have a far wider usefulness, however, he showed, demonstrating their importance in connection with insurance, financing, taxation, and many other phases of business operation.

Indicating how appraisal makes it possible for an organization to handle properly its insurance, Mr. Hossack pointed out that "if you are over-insured, you are paying out capital or profits without any compensating protection, while if you are under-insured, you stand your pro-rata share of any losses which may occur. . . . The appraisal maintained up to date," he went on, "enables the plant executive who believes in and carries insurance to control reasonably his insurance protection, as well as to be confident of being able to furnish a complete and satisfactory statement of loss in the event of fire."

"Appraisals are useful for financial purposes," Mr. Hossack said, "because relatively little investment or speculative financing is done without some investigation and



Prominent at the Convention—Left to right: L. A. Safford, vice president, McQuay-Norris Mfg. Co., presided at the merchandising session. F. E. Skinner, secretary-treasurer, The Skinner Co., Ltd., of Canada. Fred A. Cornell, vice president, the C. G. Spring and Bumper Co.

competent statement as to fixed assets." He went on to show that appraisal checks the competency of the accounts and also that it verifies the adequacy of the depreciation reserve, set up on the accounts.

"Appraisals in recent years," Mr. Hossack said, "have found an important function in taxation matters and will undoubtedly continue to be required for such purposes to a considerable degree." He went on to show how an appraisal may properly be divided into the four parts of inventory, establishment of costs, establishing of accrued

depreciation with resulting costs or values, and the summarizing, classifying and tabulating or results.

He urged that current costs and values should be established for cost accounting purposes, despite the fact that the usual practice has been to take historical costs as a basis for cost accounting purposes. Arguing this point he said:

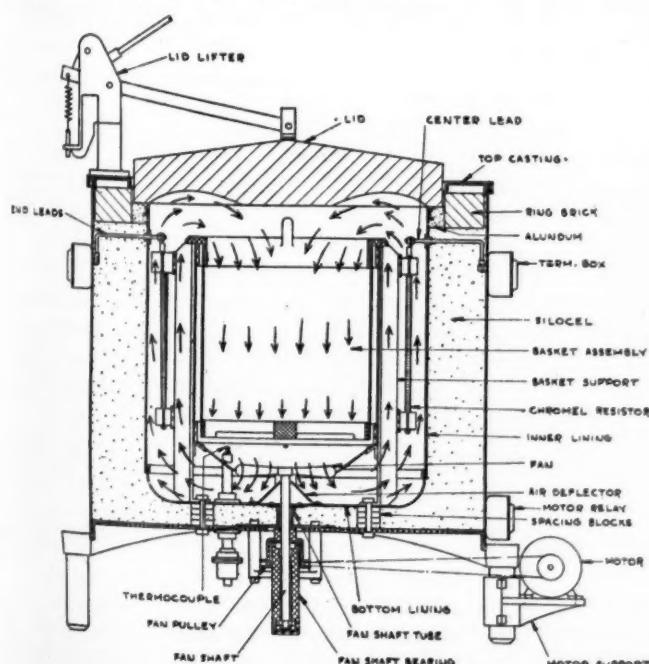
"I maintain that good management demands that the executive have full knowledge of the present facts. With such knowledge, he then can pass on whether in the individual case depreciation should be based for cost purposes in fixing selling prices on current values, or on costs, or on some compromise between the two."

The provisions of the United States Arbitration Act, which is effective January 1, 1926, were outlined at Friday morning's session by Royal T. McKenna, counsel to the M. & A. M. A. This act provides that in contracts involving \$3,000 or over a clause may be inserted calling for arbitration of any disputes arising, and that the decisions of the arbitrators will be enforced by the courts unless fraud or collusion or palpable error of fact is shown in the arbitration.

Mr. McKenna earnestly commended the act to the members, although saying that for most of their purposes the limit was too high. Aside from the time and money saved by arbitration, he pointed out, there is usually greater satisfaction for the parties concerned, who feel that their cases are being dealt with by men more familiar with local conditions and practices of the trade than most judges could be. There is a tendency, he said, toward the establishment of uniform State arbitration laws along the lines of the Federal act. The sole point of criticism is the limit, and efforts are being made to have this lowered to \$500.

Improved Method of Drawing Steel

A BOOKLET recently issued by the Leeds & Northrup Co., Philadelphia, describes the effect of inaccuracies in the drawing process on tools and parts; outlines the difficulties encountered in practice and presents the details of the Homo process of drawing steel.



Sectional view of Homo drawing furnace

The Homo electric drawing furnace is a forced convection furnace using air as the heating medium. A basket containing the work is lowered inside a cylindrical chamber, which forms the inner part of the furnace. The basket is open at the top. Its bottom is a heavy grid. Below the basket is a fan, driven by an external motor that reverses automatically. Between the inner cylindrical wall of the furnace (which closely surrounds the basket) and the heavily insulated outer wall is an air space. Heating coils of nickel-chromium wires are supported in this space between insulating clamps.

The fan, reversing at short intervals, drives the air up through the coils and down evenly through the load, then down through the coils and up through the load, and it is claimed that the heating is practically perfectly uniform and can be controlled with a high degree of accuracy.

ACCORDING to Campbell M. Hunter, who recently read a paper on the subject before the Royal Society of Arts in England, the prospects of developing an important oil industry in Argentina are more than promising. Hitherto attention has been chiefly directed to the southern coastal fields, namely, those at Comodoro Rivadavia, where, within the brief space of seventeen years, an annual production at the rate of about 750,000 tons has been built up. Now, however, increasing regard is being paid to the other and higher grade oil fields of the country, notably those in the district of Neuquen. There, as in other parts of the republic, numerous favorable geological structures are found, which in the author's opinion, are destined to play an increasingly important part in the economic future of the country.

French Makers Are Building Small Cars on Increasing Scale

Citroen, Renault, Peugeot and Mathis together producing 250 per day. Heavy production planned for new 60.2 cu. in. Fiat

By W. F. Bradley

JUDGED by American standards, 90 per cent of European built automobiles are small cars, for the average piston displacement in the Old World does not exceed 130 cu. in. The small car, according to European ideas, however, is one having a piston displacement not exceeding 67 cu. in., a wheelbase varying from 85 to 100 in., a narrower track than standard, and generally a two or three-seater open or closed body.

This type of automobile now has nothing in common with the so-called cycle car, which has failed to secure public favor. It is built up in accordance with standard automobile practice, the only technical difference, in certain cases, being the absence of a differential. Four cylinder water-cooled engines are used in every case, the transmission is generally of the three-speed variety, final drive is by standard type bevel or spiral gearing, and electric lighting and starting are included. Low pressure tires are invariably used, and in some cases the cars have four wheel brakes.

Success No Longer Doubted

The permanent commercial success of the small European car on its home market, and its growing importance abroad, can no longer be doubted. It is responsible for the big increase in the number of cars in France and several other Continental countries because it provides cheap individual transportation. In addition, in France 20 per cent of the sales are made to people who own a bigger automobile, but who find that a small car is more satisfactory for city service on account of higher average speed in heavy traffic, greater ease of parking, and low gasoline, tire and taxation charges.

With gasoline at 46 cents a gallon and State taxation at an increasing rate on a horsepower basis, it is advantageous, even when a big car is essential, to supplement it with a small car which will run 40 miles to the gallon and pays an annual tax of only \$12, compared with \$41 for an automobile having a piston displacement equivalent to that of the Ford.

Turning Out 250 a Day

Four makers, Citroen, Renault, Peugeot and Mathis, are in big production of small two- and three-seater cars, and together are averaging about 250 cars per day. In addition to these firms, which figure prominently in both home and foreign business, there are at least a dozen in France producing on a small scale or specializing in a sport type of small car. The above four are distinctive in producing a utility type of automobile.

In building up this class of business, French makers have sometimes made the mistake of competing against one another instead of sticking to a good design and seeking to reduce production costs. Produced in the first place as a

two-seater with open or closed body, a rival firm has brought out a three-seater, and to checkmate this the original two-seater has been converted into a four-seater. These modifications have tended to keep up cost and in some cases they have made a very satisfactory two-seater car into an unsatisfactory four-seater model.

As proof of its belief in the permanency of this development, not only under European but also under world conditions, the Fiat Company of Turin is producing a small car with an engine of 60.2 cu. in. piston displacement and has erected a new six-story factory which is now being equipped with modern machinery and which will give the firm a capacity, from next January, on this model alone, of 200 cars per day.

A Four Seater Body

The problem of the small economical car has been under consideration for several years by the Fiat engineers, but their final decision has been in favor of a chassis capable of receiving a four-seater body.

The following table does not attempt to cover all makes of small foreign cars, but merely those which are serious competitors for world's markets. Where price is indicated it is that of the cheapest type of body. The Fiat prices are not given, for these have not been determined for any other than the Italian market. It is believed, however, that the car will sell in competition with the leading French makes.

	Piston Dis-	placement	Track	Wheelbase	Tires	Brakes	Price*
Citroen	52.2 cu. in.	46 in.	88 in.	715 x 115	T-R	\$590	
Renault	58 cu. in.	46 in.	96 in.	715 x 115	F-R	750	
Peugeot	40.7 cu. in.	38 in.	89 in.	715 x 115	R	600	
Mathis	60.7 cu. in.	46 in.	108 in.	715 x 115	R	645	
Fiat	60.2 cu. in.	47 in.	100 in.	715 x 115	F-R	...	

*Price includes French 12 per cent luxury tax.

THE Bureau of Standards, Washington, D. C., is frequently requested to make tests of engineering materials for commercial organizations and individuals. In accordance with law, the Bureau makes many tests for other Government departments. Due to the large amount of official work, it is the policy of the Bureau not to make tests for private individuals if other laboratories can do the work.

In order to direct persons to laboratories equipped for tests, the Bureau is preparing a list of physical, chemical, and metallurgical laboratories. The Bureau will be glad to send a questionnaire to anyone who can give information about laboratories. Write to the Bureau of Standards, Washington, D. C., for the questionnaire on commercial testing laboratories.